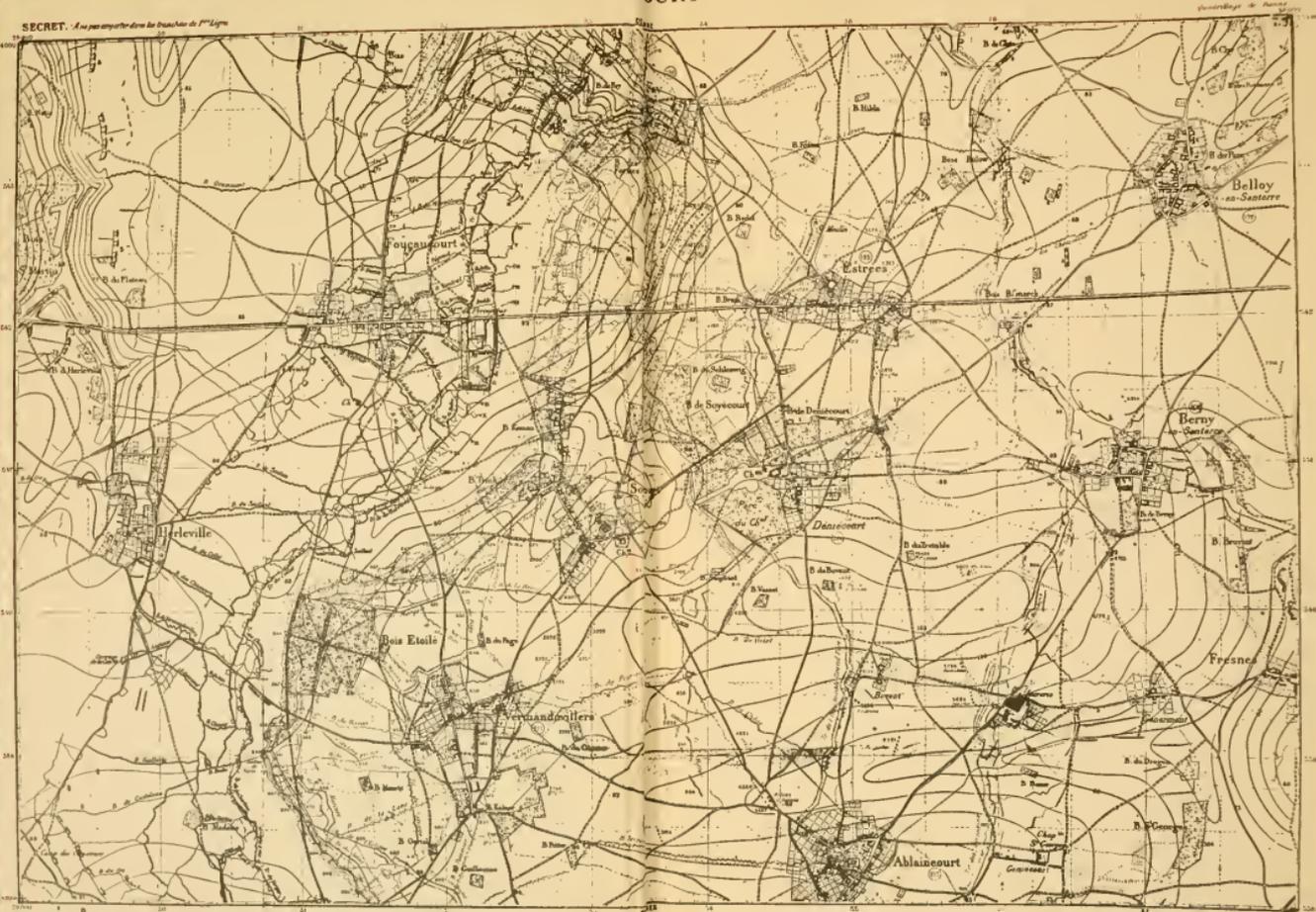


THE
WARFARE OF
TO-DAY

LIEUT. COLONEL PAUL AZAN

SOYLOURT

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THE WARFARE OF TO-DAY

EIGHT LECTURES

DELIVERED BEFORE THE LOWELL INSTITUTE

BOSTON OCTOBER-NOVEMBER 1917



By the courtesy of *Harvard Illustrated*.

MR. BAKER, SECRETARY OF WAR, INSPECTING THE HARVARD R.O.T.C.
FRESH POND, CAMBRIDGE, MASSACHUSETTS, 1917

Left to right: President Lowell, Secretary Baker, Senator Lodge, Lieutenant Morize
Lieut. Colonel Azan

THE WARFARE OF TO-DAY

BY

LIEUT. COLONEL PAUL AZAN, Litt.D.
OF THE FRENCH ARMY

TRANSLATED BY
MAJOR JULIAN L. COOLIDGE, U.S.R.

WITH ILLUSTRATIONS



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Published March 1918



TO
MY FRENCH COMRADE
LIEUTENANT ANDRÉ MORIZE
IN REMEMBRANCE
OF OUR COMMON EFFORTS IN THE SERVICE
OF THE UNITED STATES

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The title-page device is the button of the French infantry.

The end-papers are reproductions in one color of a French battle map of the Soyécourt section, corrected to June 17, 1916. The map bears the legend "Secret. Not to be taken into the first-line trenches."

INTRODUCTION

IT was a great honor for a professional soldier, such as I am, to be called to the Lowell lectureship, which has usually been reserved for the most distinguished scientists and men of letters. Indeed, I hesitated to accept the invitation. In the first place, I felt myself unprepared to undertake this new task, since I am neither a professor nor a lecturer; in the second place, I hold that in this war the abilities and energies of each one of us should be solely utilized to bring the Allied nations nearer to the goal of their desire, victory. The fruit of this victory, let us never forget, will be the liberty of the nations and the civilization of the world. The period in which we live is far too solemn for any one, especially an officer, to pause for a moment from active work.

On further reflection I saw that in giving these lectures my object would not be to seek an intellectual recreation, nor even to entertain an audience, no matter how sympathetic it might be. I came to the conclusion that here was another way in which, with the assistance of my hearers, I could continue to do my duty as a soldier. In that course of lectures I proposed to study the present war in its different aspects. In the

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effort to explain the ideas which I had gathered, I was obliged to define and classify them more exactly. My audiences thus helped me to build up on solid foundations a theory of modern warfare.

Moreover, you, my reader, can coöperate with me in active fashion. If you accept certain theories in which I believe, you can help to disseminate them. Although, little by little, logic and common sense do triumph over routine and prejudice, there are certain simple truths which it seems to me are often lost sight of on the other side of the water as well as on this. You will compel the acceptance of these truths. You will become apostles, capable of expounding them, missionaries, whose duty it will be to carry them wherever you go. Do not fear that your rôle will be that of preachers of violence and bloodshed, glorifying slaughter and the horrors of war. On the contrary, your duty will be the much more humane one of advocating methods which will involve the least possible amount of bloodshed, in a war which must be carried through to the bitter end.

These lives which we must seek to spare are very dear to you, the lives of your brothers, your sons, your husbands, who have gone, or are soon to go, across the seas to fight for the common cause. You have a powerful influence in your

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hands, for you represent public opinion, and this opinion, in a free country like yours, renders a just verdict, which even the most recalcitrant must respect.

I have already discovered, in a more limited field, what a beneficent influence upon public opinion may be exercised by a group of ardent and devoted disciples. Let me recall to you the part played by my splendid soldiers of the Harvard R.O.T.C., the very flower of American youth. Those boys learned the fundamental principles and methods of modern warfare long before the official regulations had adopted them: they were thus able, not only during the training at Harvard, but subsequently, to disseminate these principles and methods. Similarly, the five hundred and fifty American reserve officers whom the War Department sent after them to be taught by the French Military Mission, became enthusiastic converts to the new ideas. You can continue, if you will, the work of propaganda, which they have begun in the interest of the American people.

I believe, then, that at this time, when each of us should reflect upon the practical effect of every one of his acts, these lectures may be useful in helping the cause of victory. Since they are the fruit of my experiences at the Front, they will inevitably oblige me to speak occasionally of

INTRODUCTION

events in which I have been involved. I crave your pardon for this. If I quote personal experiences, it is to show you how I have been led to formulate certain principles or to demonstrate their soundness. There are, of course, many examples which I could cite over and above those in which I myself have been concerned; but as a historian, I know full well that the perspective is still too short to ascertain the exact truth as to what has occurred. It is for this reason that I shall draw from my own experience; my anxiety for the truth shall be my excuse.

THE WARFARE OF TO-DAY

THE WARFARE OF TO-DAY

I

THE PRESENT WAR

LECTURE OF OCTOBER 15, 1917

SUMMARY

Why the present war differs from previous wars: —

A war of all the people. — The abilities of each are utilized, of men of all ages, of women and of young girls. — The reactions on industrial and financial conditions. — Need for general knowledge on the part of the commander-in-chief and the officers.

A war of positions. — Simultaneous development of the power of artillery and of entrenchments. — Tactical features which have appeared in recent wars. — The errors committed in military studies before the war; Kriegspiel and the war of movement. — Definitions of position and war of positions. — Movement in the war of positions.

A war of matériel, and of use of matériel.

A war of attrition: attrition in men; attrition in matériel. — Danger of attrition for a country of limited human reserves. — Attrition in morale.

Unsuitableness of the term "trench warfare." — Absurdity of the term "war of position" (without the final s). — A German disciple of the war of positions: General von Below.

A war of brutalization. — Cruelty organized as a system by the Germans. — Violation of treaties and of international law by the Central Powers. — Reasons for this barbarity: Pan-Germanism.

The present war for the annihilation of free peoples will not overthrow them: France will survive.

It is a common remark that the present war differs from all previous ones. To the question, In what does this difference consist? the usual reply is that now we dig trenches, employ a large

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amount of artillery, make manifold use of airplanes, and refrain from launching cavalry charges. These observations are true in themselves, but do not go to the root of the matter, do not pass from the phenomena to their underlying causes. They indicate a lack of study and reflection which, unfortunately, is not confined to the amateur strategists who hold forth at parlor meetings or fashionable resorts. They neglect those essential characteristics of the present war which give rise to the methods and practices in use.

The present war differs from preceding wars in various ways. Primarily, it is a war in which all the people participate; on the tactical side it is a war of positions; it is also a war of matériel, a war of attrition, a war without pity. These are the factors which distinguish it from preceding wars, and which should be studied in detail.

. . .

The essential characteristic of the present war is that *it is waged by the whole people*, instead of being merely the affair of professional soldiers. This condition was foreseen by the majority of the European countries, and all able-bodied men were incorporated into the army at the moment of mobilization. If, however, it is true that war on a national scale was foreseen, yet the immediate consequences of such a war were much less clearly

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perceived. The mobilization in France, organized by professional soldiers, was perfect so far as concerned the calling of all Frenchmen to the colors. Each one had in his possession a leaflet indicating the day, the hour, and the place where he should present himself to the military authorities, as a mere consequence of the publication of the mobilization order. But in this assignment too little attention was paid to each man's individual capacity; the only question was whether a man should serve in the infantry, the artillery, the cavalry, the engineers, or the auxiliary services. Every one went to the firing-line. With the exception of the railroads, whose necessity was evident for the concentration of troops and their prompt supply, the majority of the vital industries were stripped of indispensable elements.

This mistake, once committed, presently became patent to every one. It was then necessary in hot haste to recall to the factories skilled workmen scattered all along the Front, to seek out motor drivers and aviators, to organize the medical services, especially the evacuation of the wounded, in more orderly fashion; and so on indefinitely.

When a people is at war, all organizations useful for that war should not only be kept running, but should render their maximum output. Each citizen has his appropriate place. No one should

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say, "I am too old, or too weak, or too badly wounded to be of use to the country." There is a use for every sort of activity. But if all individual capacities are to be suitably utilized, it is necessary that they be directed by a competent authority who should point out what needs must be met. Good-will, without direction and without discipline, is ever in danger of running into abuses. For instance, I have seen vigorous young men, capable of becoming magnificent infantry officers, undertaking medical studies under the pretext of "consecrating" themselves to the work of the hospitals. It was a noble task when America was not in the war, and when Americans were not allowed to be combatants; it is still a noble task for those who are of the medical profession; but to-day the trenches offer the field where unemployed athletes should aspire to serve.

In the general mobilization the women likewise can employ their intelligence and their capacities in the service of their country, in many cases replacing men who fight at the Front. Indeed, this is the most beautiful and most sober expression of that tendency which we call feminism. But the women must have the courage to fulfil duties that are, by no means, always agreeable. In France and England they have shouldered these burdens; I feel sure that the women of America will show a like devotion.

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It is essential that these patriotic desires be classified, organized, and directed. Many women wish to go to France. It is easy to see how they, especially the younger ones, are attracted to the Front, as moths are to the light. They long to draw near to those regions which are lit up by shells and illuminating rockets, to shudder by night at the distant thunder of cannon, to stand by when the wounded are brought in still bleeding to the dressing-stations. Far be it from me to disparage the services which have been rendered to France by devoted women; I am glad to express to them the gratitude and the admiration of the French army. Nor do I forget that, personally, I had two charming American girls at my bedside for weeks together, when I lay wounded at the Hotel Ritz. I do, however, think it right to oppose the subconscious impulse that urges a certain number of them to cross the water, without any certainty of being really useful when they reach the other side.

I have had the curiosity, as a result of questioning young women whom I have met in America, to draw up a statistical table showing the duties which they would prefer to perform; the percentages are as follows:—

Caring for wounded officers.	37 per cent
Caring for wounded officers or enlisted men	4
Knitting sweaters or socks.	16

THE WARFARE OF TO-DAY

Making hospital bandages.....	3 per cent
Driving automobiles.....	21
Teaching English to French soldiers, or French to Americans.....	8
Amusing French or American soldiers at rest camp by giving dancing lessons.....	7
Doing farm work.....	3
Serving as typewriter-secretary in French and English.....	<u>1</u>
Total.....	100 per cent

I should advise every one of them to stay at home, except, perhaps, the typewriter-secretary, whom I would gladly take back with me. When millions of young American men have gone to France, these women will be needed in America to take their places.

It appears, then, that the participation of the whole nation in the struggle is the essential quality that differentiates this war from all that have preceded it. Every man, every woman, has a rôle in the great drama which is being acted. The nation is a vast society engaged in an enterprise on which its safety depends. Those who try to hinder the progress of the machine, or even refuse to contribute their strength thereto, are unworthy to be members of the society; they are bad citizens.

The comparison of the present war with an industrial enterprise is more to the point than might at first be supposed. The war dominates the international relations, the industry, the

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commerce, manufactures, agricultural produce, and wealth of the country. It requires enormous sacrifices, carried through to the bitter end. But in case of success, it brings a proportionate return; for over and above any material profit that may eventually follow a victorious conclusion, there are moral gains whose value is incalculable. To console ourselves for all the horror and all the destruction which we see on every side, we may be permitted to hope that, in the great convulsion, Humanity will find a re-birth at a moment when it seemed on a dangerous decline. Perhaps from all these fearful collisions there will arise, as many people like to hope, a new Society of Nations!

But it is not my province to study after-war problems, economic or moral, important as their solution may be. For the moment we must win, and that is the only way to end the conflict. Now, the conqueror must be perfectly conversant with all the means of obtaining victory which are at his disposal. The generalissimo in a modern war must be not only a leader of men; he must be a geographer, an historian, an economist, a business man, a scientist, — in a word, a man of encyclopædic knowledge. Indeed, this principle has always held; Cæsar and Napoleon were great generals because they were men of universal comprehension, because their minds grasped

THE WARFARE OF TO-DAY

every problem that related to their respective countries.

This general principle has been forgotten in almost every army. Little by little, as peace has continued, or the habitual calm has been merely ruffled by wars of small extent, the army has become separated from the nation. The military profession has been regarded as a technical occupation, consisting in maintaining and transporting groups of men, who lived together under a special discipline. Many persons had the pleasing idea that the perfection of accomplishment for a general was to draw up a review or a defile of well-aligned troops, to the great satisfaction of the spectators. Other more widely informed people thought that an infantry commander who could make his men execute a long march, could deploy his battalions and launch them in a bayonet charge, was qualified to lead them to victory. Similarly, a cavalry officer who could gallop in front of his squadrons faster and farther than they, was certain to carry every position.

In what army was it recognized that an officer should study the lessons of history, the secrets of geography, the laws of economics, the productiveness of industry, the mechanism of transportation, the resources of commerce, the psychology of peoples? The rare officers who

THE PRESENT WAR

ventured on such studies ran the risk of being considered as lacking in devotion to their professional duties!

. . .

How about the soldiers who pretended that they did not need to know subjects outside of their calling? Did they have an accurate conception of the principles which have given to modern combat its present form? Many had suspected nothing, had ignored the modifications which the incessant development of artillery had made in the tactics of the battlefield. They have even, when forced to face the realities of the war and the bloody lessons of the first encounters, expressed their surprise with amusing naïveté. They have been imitated by military critics and journalists, who continue to write daily that all the laws of war have been changed, revised, overthrown.

Now, this sudden change has occurred only in their own minds, and might have been avoided by a careful study of recent campaigns. Even back in the time of the American Civil War, as one of its noble veterans pointed out to me recently, trenches were dug. In the Boer War trenches were constantly constructed, as I have heard from General d'Amade, who was present. In the Russo-Japanese War did not the murder-

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ous effectiveness of modern artillery compel the troops to protect themselves by trenches which have since become famous, for instance those at Mukden? Major-General Kuhn, of the American army, was able, some years ago, to deduce from just these facts many of the principles underlying the present war. Finally, the Balkan wars have still further illustrated the importance of entrenchment. Some wounded Serbian officers, with whom I talked at the beginning of 1916, at the hospital in Paris where we were together, recalled many instances to my mind; it is sufficient to mention one example familiar to every one, the famous Tchataldja lines.

The episodes of these different campaigns have been popularized by articles in magazines and pictures in the papers. Besides these, books of a more serious sort have been published on the subject. Instead of multiplying citations, I will content myself with mentioning a recent experience which I had at Harvard University. I gave my students the task of finding in the library, for each of the preceding campaigns, quotations showing their analogy with the present war. Two days later I was in possession of such a number of references that I should need a whole hour to enumerate them.

There are, moreover, other factors besides trenches and heavy artillery, whose intervention

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in the present war might have been foreseen. I do not wish to be put down as a prophet after the event; we shall have plenty such later on. Let me confine myself to mentioning one of these factors, because as much as thirteen years ago I published detailed historical studies thereon,¹ because I have been proclaiming the necessity for it for more than two years, and because I have not yet seen it in its proper form: I mean infantry cannon. I shall have occasion to show, in speaking of the attack on a position, how helpful it would be for the infantry to have regimental or accompanying artillery, analogous to the "battalion cannon" formerly used by Gustavus Adolphus. I hope also that the actual solution of the problem — I mean the cannon themselves — will be found by the Americans.

Why have industrious and conscientious military men failed to grasp the novel character of the war? Because they have not studied history; or, at least, because in their study of recent history, they have not followed the development of offensive arms and the resulting modification of the tactics of the battlefield. They have confined themselves to the study of the campaigns of Napoleon, or those of the Franco-German War

¹ "Etudes historiques sur l'artillerie régimentaire," *Revue d'Histoire* (edited by the General Staff), vols. 13, 14, 15. (Paris: Chapelot, 1904.)

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of 1870. From this study they have deduced an unshakable theory, which they have handled with grace and confidence and imposed upon all with that absolute trust which springs from military discipline. A blind adhesion to this theory paved the way to any reward. "*Extra ecclesiam, nulla salus.*" Without the theory, no salvation. In order to point out this danger, I published, in 1907, a little volume which, under an historical disguise, was intended to illustrate the perils of such absolutism.¹

In most of the Allied countries a gathering of officers used to take place around immense tables, covered with juxtaposed maps. Chessmen or flags represented the troops of all arms engaged in the war game, which we in France called by the German name of "Kriegspiel." It must be acknowledged that this game had the advantage that it gave the participants practice in making decisions and drawing up reports. How the cavalry used to send out bold scouting parties, how the infantry made forced marches and seized positions at the point of the bayonet, how the artillery galloped over hill and dale! The engineers appeared little, except for the defensive organization of villages or the hurried building of bridges; as for the aircraft,

¹ *Le Colonel Rocquancourt et les écoles militaires.* (60 pp. in 8vo. Paris: Chapelot, 1907.)

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that was conspicuous by its absence. What was waged was a "war of movement." After the battle there was a distribution of prizes, and a criticism by those who had evolved the theory; no danger that the awful spectacle of human hecatombs would give the lie to the arbiter in chief!

It thus came about that, instead of seeing things as they were, the majority of professional soldiers wandered about in a land of fancies and theories. In fact, the influence of these long-pondered theories has been so strong upon some persons that to-day, after three years of experimenting, the idea of the prompt reappearance of a war of movement still haunts their dreams.

The day when this sort of war reappears will be the day of victory, the war will be virtually over. The present war, to use a term which I have wished to see adopted for the last two years, is a *war of positions*. This definition is easily understood when one observes how a Front really comes into being. Take the case of the present Front in France and Belgium. The French and German armies, after marching toward one another, came into collision. The French army, led away by enthusiasm, threw itself without protection against the cannon, the machine guns, and the trenches of the German army; and left thousands of dead on the first battlefields. It retreated. At the Marne it

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offered a superb resistance, once more sacrificing thousands of lives. Then the German army retreated in its turn, but established itself solidly on the Aisne, protected by previously prepared trenches. The French army dug in opposite. Each adversary, finding himself unable to dislodge the other by direct assault, tried to outflank him. Thereupon began the famous "race to the sea"; the two armies stretched out trenches, face to face with one another, all the way between two impassable obstacles, the sea and Switzerland.

The common Front is composed, in either case, of a series of linked positions. A *position* usually corresponds to some geographical region; it comprises several less important elements, also corresponding to the terrain, called *centres of resistance*. Its importance depends upon many factors, its topography, its relation to the contiguous positions, the strength and configuration of the positions opposite, the number and activity of the opposing troops. The geographical area is generally considerable, at least several square miles. The garrison, whose strength depends both upon the geographical area and the military importance of the position, is composed of one or more large units, such as divisions. The different parts are linked together by systems of trenches which insure the continuity of the Front.

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Just as the Front is continuous laterally, in order to oppose resistance to the enemy at every point, so also is it organized in depth to stop the enemy's advance at every point in case he succeeds in seizing one or more of the first positions. There are thus second, or second-line positions, organized in the same fashion as those of the first line, but not always continuously joined. Behind these second-line positions there may be those of the third line. These last, however, are but weakly organized and occupied in proportion to their distance from the Front, since they are useful only in case a hostile offensive penetrates to the point where they are.

How shall an army, which is face to face with such a scheme of defence, set out to achieve victory? Its aim should always be the destruction of the opposing army, not the capture of any particular stretch of territory. But to destroy the enemy, it is necessary to overthrow the barrier which protects him, that is to say, to seize a number of positions, contiguous both laterally and in depth. When the breach so made is wide enough and deep enough, the defensive elements near those destroyed will be threatened from the rear and must be abandoned by their defenders. The whole Front will crumble, and the enemy will be obliged to re-form on a new line. While covering the distance between two succes-

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sive positions, there will be a war of movement. It will take place when, as a result of the opening of a breach, the troops move between two positions one behind the other; it will also take place when the attackers, after the breach is made, turn against bodies of the enemy in process of evacuating other parts of the Front in order to reach new positions. If there are no other positions to defend, or if the enemy does not choose to defend them, then, indeed, there will be a war of movement according to the old definition; but in my judgment it will mark the end of the struggle.

There is another limitation upon movement, even in the pursuit of a retreating enemy, besides the encountering of defensively organized positions: the rapidity and extent of every movement will depend upon the facility with which the heavy artillery can be displaced. An army which should venture into hostile territory without accompanying artillery, including heavy pieces, would court disaster.

It results from these considerations that victory must be sought by attacking vigorously in a determined zone, so as to break the Front and paralyze resistance. That is exactly what both adversaries have been trying to do for the last three years. Why has neither side succeeded? I shall later show in detail sufficient reasons

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for this want of success; for the moment I shall limit myself to a single reason. Since the army attacked has been menaced in a single spot only, it has always been able to bring up sufficient reserves to stop the advance of the assailants. In order to prevent the bringing up of these reserves, it would have been necessary to keep the enemy in ignorance of the intended zone of attack, and, to that end, to simulate an attack along the whole Front. Now, an attack is announced by artillery preparation, and a general artillery preparation has been impracticable for lack of sufficient cannon and munitions.

. . .

The present war, much more than any preceding one, is a *war of matériel*. An offensive, even a partial one, requires not only an enormous supply of cannon, munitions, and machines, but also factories capable of producing them, railroads and highways sufficient for their circulation, ships, cars, and trucks in plenty to bring them up, and special dépôts for their storage.

Moreover, it is not enough to have an immense amount of matériel: it is essential to know how to utilize it. A single cannon, well served, is worth twenty badly served; for a few well-aimed shells can destroy an objective, while tons of steel showered haphazard over a large area do no

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good at all. Similarly, two or three airplanes which can follow exactly an itinerary laid out in advance, or can plant their bombs with precision on a factory, are worth twenty airplanes which scatter their bombs all over the woods and fields. Thus the need of instruction for an army is paramount over all others.

. . .

On account of its national character, as well as its length, this is a *war of attrition*. In previous wars professional soldiers fought with their own resources, and settled between themselves the quarrels of nations. To-day, it is the nations, with all their forces, human and material, that take part in the struggle; they fight till one of the adversaries is completely exhausted. Thus attrition, which applies to both men and matériel, is bound to be a factor of importance in deciding the war.

Attrition in men is irreparable; it takes twenty years for a child to reach the fighting age. It may be estimated by comparing the total number of men called to the colors at the beginning or during the course of the war, with the total number of killed, permanently disabled, and captured.

Attrition in matériel can be offset by greater activity in the factories, but these factories must



THE WAR OF MATÉRIEL — A MUNITIONS DÉPÔT IN THE REAR OF AN ARMY



THE WAR OF MATÉRIEL — TRANSPORTATION OF SUPPLIES BY A NARROW-GAUGE LINE ALONG A ROAD

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be sufficiently numerous and sufficiently well equipped to meet the needs of the army under all circumstances. If, at any moment, there should be a shortage, either of raw material, such as copper, iron, coal, or cotton, or else of machinery, or of workmen, so that the requirements of the army could not be met, the result might be a catastrophe.

Attrition in men is not very dangerous for countries which have sufficient human reserves, such as Russia, nor yet for those like France and Great Britain which can draw on their colonies. On the other hand, it is highly dangerous for countries like those of Central Europe, where human resources are strictly limited. For these countries there will inevitably come a time when, in spite of the utilization of prisoners, citizens of conquered countries, women, and children, it will be impossible to find enough men to hold the Front and to run the factories. The choice must then be made between leaving the Front insufficiently defended, or the factories insufficiently manned. Either means defeat.

Attrition in morale may have the same result as attrition in men and in matériel; it consists in the disintegration of moral power, especially of the sentiment of patriotism. It leads on to the voluntary abandonment of the conflict even though the country may still possess the human

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and material resources necessary for its continuance. This attrition in morale is sometimes effected by the secret activities of the enemy, who makes use of a skilful propaganda to sow discord among the citizens, and to cause discouragement to permeate the armies and the civil population.

. . .

Thus the present war, which I have defined as a war of positions, is, from another point of view, a war of matériel and a war of attrition. It is not a *war of trenches*, even though that term is now sanctioned by usage. No description of the conflict seems to me worse than the phrase "trench warfare," which appears in all the magazines, all the newspapers, and on the title-pages of many books. It is likely to lead to most unfortunate conclusions. It was invented by people who took the means, or, rather, one of the means, for the end.

No, the present war is no more a "war of trenches" than it is a "war of artillery," a "war of asphyxiating gas," or a "war of grenades." It is, I must repeat, a *war of positions*, spelled with the final *s*. Certain writers, hearing this term, have seized upon it, but, unable to shake off the idea that this was a war of trenches, carried on in holes in which the troops perma-

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nently remained, have described it as a "war of position" (without the final s). This meant, in their minds, a war where each side stayed in one position, whereas the characteristic of a war of positions (with the s), is precisely the attempt to pass from one position to another.

Little by little the principles which seem to me to dominate this war are gaining recognition. Since the close of 1915, when I wrote the book which has been so kindly received this year by my American friends,¹ many of these principles have been generally recognized. A doctrine of modern warfare has gradually crystallized in the Allied armies, through the medium of numberless official regulations; it would be interesting to make a synthesis of these in each of the armies, in order to reconcile and classify them. A long step has been made in this direction in the French army in the "Manuel du chef de section," which has been translated for the benefit of the American army.

Strangely enough, it was in a German document that I first saw a succinct résumé of the essential principles of the war of positions. This was drawn up by General von Below, who commanded one of the German armies on the Somme in the latter half of 1916. It must have fallen

¹ *The War of Positions*. (Cambridge: Harvard University Press, 1917.)

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into the hands of our troops in the course of the battles of 1917, or through some other means; at any rate, it was published in "L'Illustration" for September 1, 1917, under the title, "Principes de la guerre de position" (without the s). I read it with the greatest astonishment, for I found therein certain passages almost identical with some used in my own work. It is quite impossible that any of the forty typewritten copies which I distributed in the spring of 1916 should have reached the enemy; the coincidence simply shows how two men, considering the same series of events, seen from one side or the other of the battle line, will be led by logical steps to the same conclusions.

Just the same, it was piquant to find in the camp of the enemy the most faithful adherent to a doctrine which I have at heart.

. . .

On the other hand, there is one characteristic which the Germans have impressed upon this war, which no civilized man can join them in approving, namely, inhumanity and cruelty. "The more frightful the war is," say some of them, "the shorter it will be. Let us treat our enemy without pity; he will then be obliged to cry for mercy." Europe, since the barbarian invasions, and the other continents since the As-

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syrian wars in Asia, or the wars of slave traders in Africa, have never seen such atrocities.

Humanity had the right to expect that war, if it were indeed a necessary curse, should nevertheless become progressively more humane in practice. The Middle Ages, and the ages which followed, had furnished the spectacle of chivalrous conflicts between honorable adversaries. The memorable wars between the English and the French were strewn with episodes analogous to that of the battle of Fontenoy. "Messieurs les Anglais, tirez les premiers," was the courteous word of our infantry commander; a piece of courtesy which cost the lives of a good many French officers and men. In the same way, during the Napoleonic wars, our armies had conquered almost the whole of Europe, without molesting the civil populations, and passed through countless towns, without damaging them. Even in the Franco-German War of 1870-71 the excesses of the German army, such as the burning of Châteaudun, were exceptional and isolated; they were generally limited to the pilfering of certain household articles, among which clocks and silverware occupied the leading place.

In order to restrict abuses in time of war, the Powers had established certain principles of international law through the medium of agreements. Such were the Geneva Agreement of

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July 6, 1906, relative to relieving the distress of the sick and wounded of the armies in the field; the Hague Agreement of October 18, 1906, concerning the laws and usages of warfare on land; the Hague Declaration of July 29, 1899, prohibiting the use of projectiles whose object was to spread harmful or asphyxiating gases.

France, trusting and credulous, felt sure that these conventions would be observed. A large part of the official instructions for the field service of our army had to do with the principles of international law which officers and enlisted men were required to know. In the pages of these regulations we read that Germany, Austria-Hungary, Bulgaria, and Turkey gave their full adherence to these humane agreements!

Let it be clearly understood: the Central Empires solemnly signed every one of these agreements; they have since deliberately violated every one, thus excluding themselves forever from the society of civilized nations. Do we need to recall the fact that from the beginning of the war Germany has violated the territory of Belgium, a country whose neutrality was protected by special treaties, and which might consequently hope to live in peace? The violation sprang from the cynical principle expressed in the famous adage, "Might makes right." Germany deemed that all means were good which

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helped her toward victory. She hoped, by passing through Belgium, to take France unaware, and to destroy her in a short time. The plan very nearly succeeded. I have often been asked in America, "Why had not your General-in-Chief planned a concentration of French troops along the Belgian frontier?" I am not in the secrets of Marshal Joffre, even though I had the honor to be in his confidence, and to serve under him on the General Staff, yet I can reply without hesitation: "Because the General-in-Chief is a man of honor." Incapable himself of violating the promises made by France, he never imagined that Germany would break her plighted word.

In a contest with an unscrupulous adversary, a man of honor is at a disadvantage, because he has scruples about the means to be employed. The Germans and their allies have not been bothered with scruples. They have even committed atrocities which had no practical utility. Let me recall some episodes familiar to all: the use of the French civil population or of prisoners as a screen to prevent the adversary from firing; the use of the Red Cross, either to draw near to our trenches without arousing suspicion, or to induce our soldiers to show themselves; the slaughter of wounded; the systematic destruction of villages, gardens, trees, and cultivated ground; the bombardment, for no military rea-

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son, of public monuments, such as Rheims Cathedral; the mining of historic structures, such as the Château de Coucy; the enslavement of the population of invaded territories; cruelty to prisoners, etc., etc. If we turn from the Germans to their allies, we remember the hanging of the Italian patriot Battisti by the Austrians; the treatment meted out to the Serbians at the hands of the Bulgarians; the massacres of the Armenians by the Turks.

It all seems like a nightmare, when one observes the cruel and savage dementia which has seized our enemies. I could cite a hundred examples, of which I have the proof, either by the testimony of irreproachable witnesses or by my own eyes. But I am a soldier, and my business is to fight, not to rake up horrors; I merely note those of which I have actual knowledge against the time when the tribunal of civilized nations shall know how to judge the guilty!

What possible motive can have driven the Germans to such actions? It is a strange perversion, gradually born of the Pan-Germanic idea. The famous device, "Deutschland über Alles," has engendered a desire for the abasement of other peoples. First of all, it was necessary to enslave France, to modify the French spirit, and to make it similar to the German. To that end it was needful to abolish the past, to

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attack historical monuments, to destroy every vestige of French national history. There would thus be accomplished a great work of intellectual and moral regeneration, the necessity for which the German propaganda sought to demonstrate to the world, by hypocritically discrediting France. This work was carried on, not only in the name of German superiority, which should compel recognition by the whole world, but also, Heaven help us! in the name of the old German god, who was called to reign over this new humanity. "Gott mit uns" is on the belt-buckles of the soldiers who are going to death for this grand cause!

It is by these vital moral questions that the present war is differentiated from previous wars. It is not a quarrel between two or more peoples, on account of contested territorial or economic interests; it is a conflict on which hangs the liberty of nations, and the civilization of the world.

. . .

There can be no doubt as to the outcome of this war. In spite of the "Gott mit uns" of the Germans, it is not their god of war and carnage that will regenerate the world after that victory which we shall achieve in common; it is our God, the God of peace and love. And in spite of their device, "Deutschland über Alles," the Allied

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peoples will resume their peaceful development without waiting for permission from the Wilhelmstrasse.

The war of annihilation which has been waged against France, more than against any other nation, will have the effect of giving my beloved country a new lustre. Doubtless we have sustained losses the extent of which we cannot exactly estimate from this distance. We have witnessed the deaths of our brothers, our fathers, our friends; we have seen our territory invaded, our towns and fields destroyed, our fortunes carried away in the tempest. But beyond all these disasters something remains; there remains the soul of France, more pure, more heroic, more resplendent than ever. No; France is not stricken down; France will live; France is immortal!

II

TRAINING AN ARMY FOR MODERN WARFARE

LECTURE OF OCTOBER 22, 1917

SUMMARY

Instruction saves losses and gives victory. — Definition of instruction. — To whom it is directed. — Principles of specialization and of coördination.

Part played by the different arms in an army. — Infantry: the movement and its fire; arms of low and high trajectory; the bayonet; the 37-mm. cannon; the knowledge that an infantryman must possess; courage his essential quality. — Artillery: its part on the offensive and on the defensive; trench artillery; assaulting artillery; artillery on rapid motor vehicles; field artillery; heavy artillery; high-power artillery. — The engineers: their instruction as a whole, and the instruction of special units. — Cavalry: its decreased importance; its use as infantry. — Aircraft: airplanes for information, for the adjustment of fire, for fighting, for bombing; balloons; dirigibles. — Specialization. — Coördination.

Organization of the instruction of an army. — The problem of instruction is a permanent one. — Demonstration of four essential principles governing the organization of instruction. — Instruction must begin from the top, not from the bottom.

Practical organization of the instruction in the French army. — How the necessity of this organization appeared. — Schools for officers and schools for specialists. — Permanence and continuity necessary for schools. — Army schools: divisional dépôts and their schools; battalions of instruction and their schools; dépôts and camps in the interior. — Essential function of army schools. — Choice of the director of instruction of an army and of his collaborators.

Organization of the instruction of the American army. — The American Mission at Paris. — The French Mission at Harvard University. — Proposals made in April and in May, 1917. — Part played by the Harvard R.O.T.C. and the Iron Battalion. — Arrival of the Anglo-French Mission: its dispersion in the camps. — Logic will sooner or later vanquish error. — We must "conquer without dying."

IN order to wage war, the first step is to learn how. Troops who are well taught before going

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to fight are sure of two advantages: their losses will be relatively less, and they will be better prepared to conquer. On the other hand, if their training has been insufficient or ill-conducted, they will surely be slaughtered, and, needless to add, they will not be victorious.

What is meant by "training an army"? It is the preparation for war. Now, the present war is a war of the whole people; that is to say, it makes use of all the forces of a nation. To train an army means, not only to instruct the first-line troops in trench-digging and formations; it involves also teaching the masses who stay in the rear how to render the best service in the struggle.

The national character of the war implies a many-sided education for the nation at large. Not only must the infantrymen, the artillerymen, the aviators, the engineers, and the cavalrymen all be trained; it is equally essential to instruct men who can be of use in the medical corps, in the quartermaster's department, the ordnance, the railway service, the motor transport, the information service, the topographic service, etc. Finally, even the civilians must be taught; those who help to win the war by their labors in the factories, the fields, or the hospitals, by practising economy in the consumption of provisions, by material and moral collaboration at all times.

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Two great principles dominate this kind of education: specialization and coördination. On the one hand, each man should receive special training, not only in his own arm or branch of the service, but also in his particular function in that arm or branch; on the other hand, he will not really understand his rôle, nor fulfil it well, unless he has some idea of the general conduct of his arm or branch, and of its relation to the army as a whole. For this reason it is needful that each one should receive, even during the period of practical detailed training in his own specialty, a general education in the conduct of the operations of the war.

The training of that part of the nation which remains away from the war zone is the affair of the departments of ordnance, industry, commerce, supply, agriculture, etc., and of their various representatives. I therefore merely mention this side of the general problem, without studying it.

The training of that part of the army which is not combatant, in the strictest sense of the word, — that is to say, of the sanitary service, supply and quartermaster service, railways, motor transport, topographical service, etc., — involves special methods, to be devised by the chiefs of these various services; I shall not consider this training either, although insisting upon its importance.

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The "training of an army" will thus mean, in my exposition, what was formerly understood by that phrase; that is to say, the training of the infantry, the artillery, the engineers, the cavalry, and the aviation. Before studying how this training should be given, it is essential to know exactly what is the rôle of each of these arms in modern warfare.

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The infantry is destined to occupy the terrain. On the offensive, the progress of its first line measures the success of the attack; on the defensive, the maintenance of its position implies a check administered to the enemy. In neither case can it dispense with the aid of the artillery.

The infantry has two methods for accomplishing its aims — movement and firing. By movement, I mean advancing; by firing, I mean the discharge of all the weapons that are suitable to the infantry.

Before the present war it was believed that sufficient fire preparation for an infantry attack could be effected by the infantry's own arms; that is, by the rifle. In company manœuvres, the men took advantage of the accidents of the terrain; for instance, they lay down and shot, so as to force the adversary to take cover; then they

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jumped up and made a short rush, before the enemy had time to shoot. A frequent proceeding was to have each group of skirmishers advance or retreat under the fire protection of the adjoining group.

To-day, the effects of artillery and machine guns have obliged the troops to dig trenches. As long as the enemy remains in his trenches, the fire of rifles, machine guns, and, in fact, of all infantry weapons of flat trajectory, is quite powerless against him; the only danger is for the man who may imprudently raise his head above the parapet. For this reason it is impossible to advance against a properly constructed trench unless that trench has previously been subjected to artillery fire; infantrymen who should attempt to seize it unaided, even if they ran like hares and brandished their bayonets ferociously, would be slaughtered just as surely as the quarry is slaughtered by the watching hunter. How many times have I had occasion, during the first exercises of the Harvard R.O.T.C., to ask the men what they were firing at:—

“At the enemy’s trench,” would come the reply.

“You won’t do it any great harm,” was my answer; “and even if any man were idiot enough to offer himself as a target for your practice, that

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would be no great loss for the enemy, as they would only lose a fool of a soldier.”

Even after the artillery preparation is finished, the assailant's task is often difficult. In the enemy's shattered trenches there will still remain defenders who must be overcome. This is especially true when the attacking troops have passed the first-line trenches, and are in the region, either of other trenches less thoroughly destroyed, or of new trenches constructed in haste. At such a moment the infantry should be able to advance by the aid of its own resources, for it is quite a mistake to suppose that the artillery relieves the infantry of the necessity of making any effort whatsoever. To reach the enemy's trenches it must in this case make use of high trajectory weapons, such as hand grenades, rifle grenades, and the different sorts of bombs thrown by infantry weapons.

When the infantry are obliged to attack the last surviving defenders of a trench at close range, they either attack them from the parapet with automatic machine rifles or grenades, or else they jump into the trench and use these same weapons. Since the bayonet is hard to use in the restricted space where such fighting takes place, it is often well to use the knife.

The flat trajectory arms — that is to say, the rifle, the automatic rifle, the automatic machine

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rifle, and the machine gun — lose none of their effectiveness on the defensive against an enemy who advances in the open. Similarly, these are useful on the offensive when the enemy leaves his trenches or his *boyaux*. No one should fall into the mistake, recently pointed out by General Pershing, of decrying the usefulness of the rifle in the present war. The rifle is not used at the outset of the combat; yet it may be of considerable use in the succeeding phases, especially in one of its derived forms as a machine gun, automatic machine rifle, or automatic rifle.

The arms with high trajectory are those to use against an entrenched enemy, and, since the enemy is always seeking to entrench, they are useful at every stage of the combat. Hand grenades, rifle grenades, and bombs are of the greatest use when it is possible to have them in sufficient numbers. But the greatest difficulty is to secure an adequate supply during the progress of the advance. An excellent expedient is to use the *dépôts* of munitions of like sort to be found in the enemy's lines, and for this purpose it is well to teach the soldiers how to handle the enemy's grenades, as well as those of his own army. For instance, at the battle of the Somme, the Sixth Army had seized such a supply of grenades that I was able, when charged with the organization of army schools, to institute among

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the grenadiers a special course for studying the use of German grenades.

The "arme blanche," the bayonet, is less used than in previous wars. It and the knife are, primarily, "cleaning-up" weapons, to use a phrase familiar to all. The bayonet was much used at the time when rapid-fire rifles were less perfect than they are at present; its use permitted the attackers to charge the enemy while the latter was attempting to reload. It was formerly the favorite arm of the French infantry. But to-day, as long as the adversary has a firearm or a grenade, he cannot be reached by the bayonet; if he is unarmed, despatching him is simply a species of assassination.

Certain officers maintain that it is well to make the enlisted men believe that the bayonet is really effective; they assert, for instance, that the men thus acquire confidence in their individual arms, and are less tempted to run away, or at least to halt, when they have no more grenades or ammunition. This theory seems to me to present two disadvantages. First, just as certain people, who tell the same lie a great many times, end by believing it, so some officers end by insisting in all good faith that the bayonet can really win the battle. I have met such. Secondly, soldiers who have acquired this confidence in their bayonets, advance holding them ten-

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derly to their breasts, and are decimated without accomplishing any great result. In France the soldiers know the truth. When they go forward to the attack, they know what little help the bayonet will really bring and how exceptional are the circumstances under which they can use the knife; nevertheless, they do go forward. I think that this intelligent courage is, from every point of view, of more value than a courage based upon artificial stimulation.

The 37-mm. cannon is, at present, the most powerful weapon in the possession of the infantry. On the offensive it is used to prepare the attack on a position, to accompany the troops during their advance, and to help occupy the new position. On the defensive, it can assist in the barrage, especially by enfilading fire upon points reconnoitred in advance. This cannon has great virtues, among which are to be reckoned mobility and precision, but its principal function is to destroy machine guns which have escaped the artillery fire. It is a "counter machine gun"; it is not an accompanying cannon permitting the infantry to overcome obstacles by means of their own resources. As for this desired infantry cannon, let us hope that some day its necessity will be recognized, and some inventor found to design it.

The infantry should learn the technical use of these various arms, and acquire the greatest

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possible familiarity with their management. It should, moreover, learn their tactical use. According to the different phases of the combat, even according to different aspects of the same phase, different arms should be used. Any tactical mistake in the use of the arms placed in the hands of the infantryman condemns him to failure and death. The technical and tactical use of arms forms but a small part of the soldier's training. The infantry should, beyond this, know what formations to adopt during different phases of the combat or during different episodes of the same phase. For instance, it must know that it must not present dense formations, as column of fours in a zone where artillery projectiles are falling; it should be able to organize the terrain by digging suitable trenches along intelligently chosen lines, etc.

The infantryman, even when well trained in all of these details, has yet the hardest sort of rôle to fulfil. He is obliged, even more than a soldier in one of the other arms, deliberately to risk his life and freely to shed his blood, unobserved by all, in order to achieve success. To do this, he must have enthusiasm and dash. These qualities are innate in the true American, as in the true Frenchman; they will appear fast enough when called to life by a few well-chosen words.

The essential rôle of the artillery is to collab-

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orate with the infantry, for without such collaboration, the infantry is helpless.

On the offensive, the artillery first effects a thorough fire preparation; thereafter it protects the infantry during the attack, and helps its progress. It is deplaced forward when needed, either to retain possession of conquered territory, or to help in the pursuit, or to prepare for an attack on the next position.

On the defensive, the artillery arrests or impedes the enemy's advance by every available means. The best way to do this is by a barrage, which is intended to deluge a specified zone with projectiles, thus preventing the enemy's passage across it.

On the offensive, as on the defensive, the artillery, thanks to the range of its pieces, can effect a concentration of fire on any important point. In former times it was the regiments of infantry which were hastily rushed to certain parts of the battlefield where the victory was at stake; to-day, it is the fire that is concentrated, by the simple process of modifying the grouping of the pieces, and designating to each the objectives to be reached.

Artillery is divided into the following kinds: trench artillery, assaulting artillery, rapid motor artillery, field artillery, heavy artillery, and high-powered artillery.

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Trench artillery is meant to be placed in the trenches, to prepare an attack. It is composed of short-range mortars, throwing highly charged projectiles, and is able, unaided, to destroy the enemy's first line. These mortars are of 58, 150, 240, or 340 mm.; even the 58's, which are the lightest, are not sufficiently mobile to constitute a true "infantry artillery" advancing in the wake or at the disposition of the infantry units. If they were sufficiently mobile, their supply with projectiles would be next to impossible.

Motor artillery includes pieces of two kinds: the first are heavy and slow to move — these are called "assaulting artillery"; the second are light and hence mobile — these are "motor cannon" and "motor machine guns."

Assaulting artillery is composed of special motor pieces, called "caterpillars," such as tanks, which move across every sort of terrain; it accompanies or precedes the infantry, to facilitate its task. It is the only strictly accompanying artillery that has been created so far; the 37-mm. being too weak and the trench mortars too immobile.

The rapid motor artillery is composed of motor cannon and motor machine guns. It is especially useful in the interval between the capture of one position and the encounter with the next. It frequently replaces cavalry, or sup-

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plements it by moving in concert. It is able to make bold manœuvres, thanks to its rapidity and its invulnerability to rifle bullets or shrapnel; but it should never engage the enemy without a rapid preliminary reconnaissance, and must be withdrawn in haste when exposed to artillery fire.

Field artillery can be rapidly deplaced, moved across all sorts of country and set up in batteries without delay. It includes 75, 80, and 90 mm. guns. Its function is to destroy accessory defences and light shelters, to shell the personnel, and to neutralize the fire of such of the enemy's artillery as is within range. Its mobility enables it to follow the infantry during an attack, to support it, and to take an active part in all phases of the combat.

Heavy artillery is divided into heavy field artillery and heavy fixed artillery. Heavy field artillery is moved by tractors, or by horses; heavy fixed artillery derives its name from having no regular means of progress.

Heavy artillery is charged with the task of destroying those defensive works which have been established for a long time and constantly strengthened, so that the field artillery is helpless against them. Its fire should be directed against clearly defined and sharply delimited objectives. It has also the task of destroying, or at

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least of neutralizing, the enemy's artillery. It includes both long and short cannon. The long cannon, — 95, 105, 120, and 155 mm. respectively, — thanks to their great range, are able to attack distant objectives. The short cannon or mortars — 155, 220, and 270 mm. — are able, in consequence of their high trajectories, to take under fire objectives on a reverse slope. As a result of the great explosive force of their projectiles, they can destroy highly organized works.

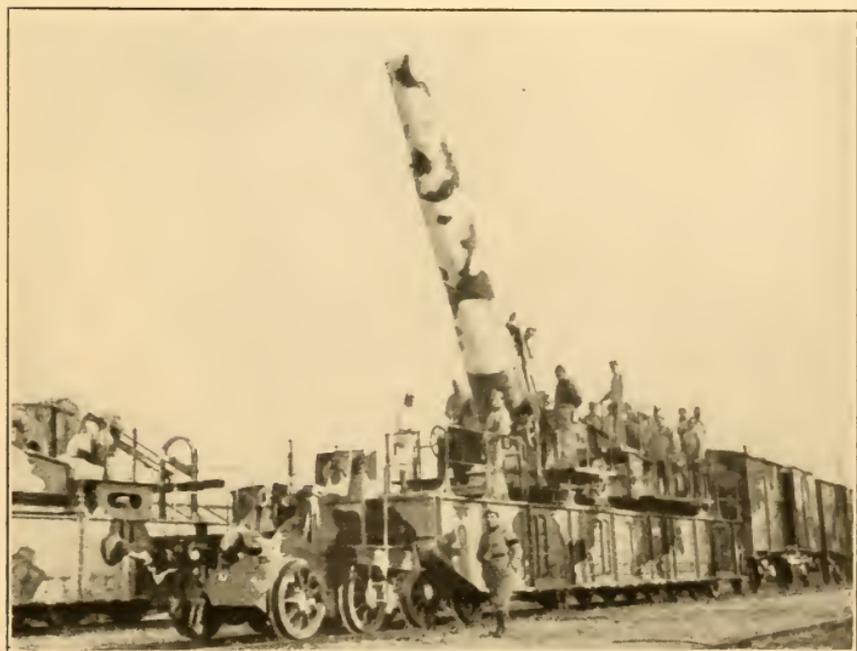
High-powered artillery includes pieces which are moved on railways or towed by tractors. Its function is to shoot at places of tactical importance, or at elements of hostile artillery which the field artillery has been unable to destroy, thanks either to their great distance, or to their protective works.

The most important of the longer guns are of 14, 16, 19, 24, 27, 32 cm., 305 and 340 mm.; the principal shorter guns are the 370 and 400 mm. howitzers.

Each of these different kinds of artillery requires a personnel that has been thoroughly trained not only in its own special branch of artillery, but even in particular functions in connection therewith. The artilleryman charged with serving a 155-mm. gun has nothing in common, but the name, with the artilleryman who takes his place in a trench.



A PIECE OF FIELD ARTILLERY UNDER A SHELTER



A PIECE OF HEAVY ARTILLERY, 370 MM. CALIBRE AND CAMOUFLAGED

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The engineers are a constant and indispensable auxiliary to the infantry. Their duties consist in helping the infantry to organize positions, in establishing or improving means of communication, and in carrying out or directing sapping or mining.

The establishing or improving means of communication involves tasks of the most diverse natures; the building of permanent, temporary, or pontoon bridges; the construction of railways or roads; the running of telegraph lines; the care of searchlights and carrier pigeons.

The engineers, in consequence of this, need even more special training than do the men of the other arms. But it should not be forgotten that those who are destined for the principal tasks should be able, according to the exigencies of the moment, to execute any one of these tasks; for instance, to construct a road, a shelter, or a post, to destroy works, or to repair them. We are coming more and more to use mechanical means for making earthworks.

If the engineers alone were loaded with all of these duties, their task, in a war where so much digging is going on all the time, would be quite an impossible one. In many cases, however, although the engineers are charged with directing the works, or giving advice about them, it is the infantry, the cavalry, or the artillery that

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actually furnish the laborers needful for their execution.

The cavalry has a rôle of minor importance in the present war. Its former rôle consisted in exploring as far as possible, in obtaining information about the enemy, and in covering the front of the troops during the march. To-day, the aircraft has taken the place of the cavalry for exploration and reconnaissance. During those phases where there is movement, namely, the pursuit and the march of approach, the cavalry may, in part, resume its former rôle. As soon as it is exposed to the fire of infantry under cover of machine guns or of artillery, it runs the greatest risk of annihilation. It can hold the ground for the time being only by fighting on foot. In like manner, during a period of stationary fighting, the cavalry is used as infantry, and shares in the occupation of the trenches. Hence the most important specialty for a cavalryman is to be a foot soldier.

The aircraft has an important rôle. It reconnoitres behind the enemy's lines, observes the first-line troops and watches their movements; it also takes active part in the combat. The machines consist of different types of airplanes, observation balloons, and dirigibles.

The airplanes are called upon to obtain all manner of information about the enemy's posi-



A French machine, carrying the tricolor identification marks



A German machine, carrying the black cross, captured the same day
LANDING-GROUND ON THE AISNE, NEAR FISMES, JANUARY 24, 1917

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tions. To this end they are provided with perfected photographic apparatus, by means of which they are largely instrumental in keeping up to date the maps showing the enemy's works, his batteries, railways, etc.

During the course of the combat, the air-planes watch the progress of their own infantry, communicating with them by means of signals; they also keep an eye on the enemy's infantry, so as to discover preparations for a counter-attack or to indicate the direction of a retreat.

The fire-adjusting planes are entrusted with the duty of directing the artillery fire to its objective; that is to say, they adjust the fire by signalling whether the shots are too long or too short.

The fighting planes have the special responsibility of preventing raids by the enemy's aircraft. We all know how skilful certain aviators have become at this game. Some of these men, provided with special machines, have the duty of setting fire to the enemy's observation balloons or dirigibles.

The bombing planes pass over the enemy's lines, and drop bombs upon points of tactical importance, such as railroad stations, factories, camps, dépôts, reserve cantonments, collecting stations, and centres of communication. They sometimes succeed admirably in this. I well

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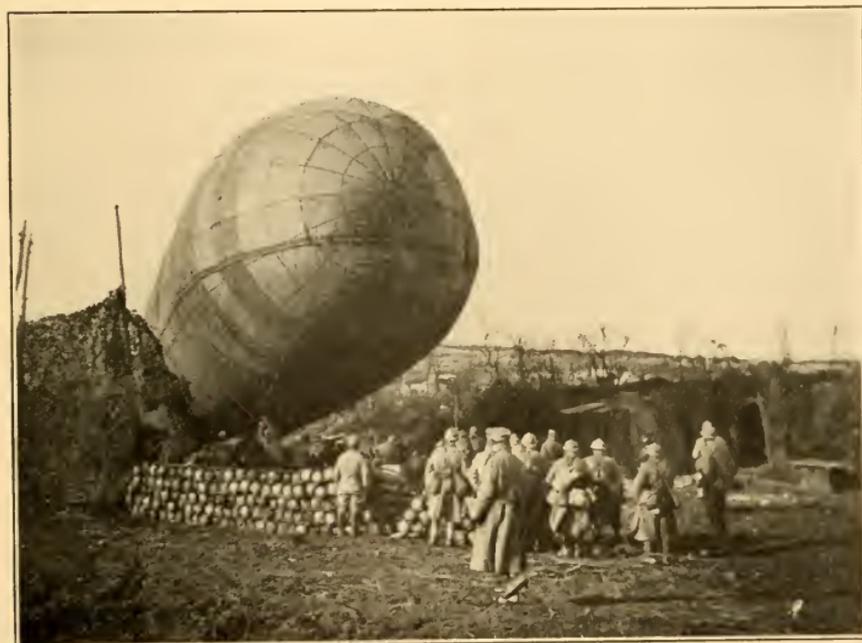
remember a night on the Somme in the autumn of 1916 when, at about 10 P.M., the Germans blew up an enormous ammunition dépôt situated at Chérisy and belonging to the Sixth Army. I was there with Major Boussavit, at present in America, in a shed at Méricourt, not far from the dépôt. The effect at night was terrific; the fire gained little by little, and the explosions continued until nearly noon the next day. It appeared that the airplane which had performed the feat was not a special bombing plane, but, thanks to great audacity on the part of the pilot, it had descended, under cover of a dark night, to a height of two hundred metres, right over an ammunition train which was arriving at the dépôt station, and had managed to bomb this train.

Last of all, the airplanes can undertake to injure the enemy's troops by dropping bombs on them, or by shooting at them with small cannon or machine guns. But, except in the case of an important objective like a column at close quarters, or artillery in retreat, the effect is more that of causing panic than the infliction of serious loss. The reason is that an airplane can carry but a limited stock of projectiles, and has no means of obtaining a fresh supply.

The observation balloons are in place during periods of stationary fighting. They are placed



AN OBSERVATION BALLOON ON LANDING; ITS REMOVAL TO THE GARAGE
ON THE SOMME, NOVEMBER, 1916



HOUSING OF AN OBSERVATION BALLOON IN ITS CAMOUFLAGED
GARAGE. ON THE SOMME, NOVEMBER, 1916

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at a discreet distance behind the Front, allowed to rise to a specified height by letting out their cables, and connected with the ground by telephone. They are auxiliaries to the Command, and to the artillery. Since they are unable to protect themselves, they are protected by fighting planes, which prevent the enemy's planes from approaching. They are usually out of the range of the enemy's guns, but when, by chance, they find themselves within range of his fire, they have no resource but to come down, in case their own artillery is unable to silence the enemy's pieces.

I was present when an incident of this sort occurred in the beginning of 1915 at Elverdinghe in Belgium, where I was in a rest camp. I had gone out on horseback along a road, near which was an observation balloon. All at once some German shells began to burst around it in a very determined fashion. The balloon came down without losing a minute, much to the relief of a number of soldiers who were struck by shell splinters falling on the road and adjoining country.

The object of dirigibles is to bombard the enemy's territory; they have the advantage that they can carry a large amount of ammunition. But they can travel only at night, owing to the large surface they expose to artillery fire;

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they also have serious difficulties in accomplishing any military objects they may have in view, so that in practice they do not manage to do much but slaughter old men, women, and children. In fact, this seems to be the only object which the Germans have in view when they set out to bombard towns in France or England which have neither garrison nor military organization. Instead of terrorizing the inhabitants, as the Germans fondly imagined would be the case, they have filled them with a desire for vengeance and with a frenzy of patriotism.

The true use of dirigibles seems to be to fly over the seacoast, since their crews can see a submerged submarine or a mine, just as one sees a fish in a river.

A superiority in aviation secures, for whichever side possesses it, an immense advantage over its adversary. If this superiority should be incontestable, if through a manifest advantage in equipment it should end in completely blinding the enemy, this in itself would insure victory.

It is quite as needful in the air service, as in the other arms, that each man should be a specialist, should thoroughly understand the machine with which he is entrusted, its virtues, its defects, and its tactical use. He must be an expert photographer if his duty be to take photo-

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graphs, an excellent machine gunner if he must shoot at an aerial adversary, a good artillerist if he must adjust the fire of batteries.

The preceding exposition of the multifarious rôles which the fighting arms must fulfil shows that the training of an army, even when we mean thereby the training of the first-line elements, includes a large number of specialties. Furthermore, I have passed over in silence a large number of specialists, because their total numbers were small compared with the army total. I might have mentioned motor drivers, cartographers, camoufleurs, periscope observers, and men in charge of special apparatus, such as that for listening to subterranean noises, that for discharging asphyxiating gas, for meteorological observations, for throwing flaming oil, for sound observations, for acoustic signals (mechanical trumpets), etc., etc. I have also omitted certain specialties which every soldier should know, such as the construction of shelters, or the means of protection against asphyxiating gas.

No matter how perfect the knowledge which each specialist might possess of the machine entrusted to his care, and of his specific task, yet no fruitful result could be obtained unless there existed a perfect coördination between the different specialists of the same arm and between those of different arms. The coördination con-

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sists of the sum total of general knowledge and of practical means which permit the different arms, and the different specialists of the same arm, to support one another, and to work together for victory.

General knowledge is the corner-stone of co-ordination in the sense that without it no initiative can be taken and no practicable decisions made. It is based upon instruction covering the war as a whole. First, each specialist must know the place of his arm in the whole scheme of things, and the means of coördinating his personal activity with that of other specialists. Secondly, he must have clear ideas as to the functions of the other arms, the help which he may expect from each of them, and the help which he must render in turn. This coördination is the particular care of the commanders throughout the various grades of the hierarchy.

It is a curious fact that the importance of general principles is frequently overlooked by the neophyte in military affairs. I have found this to be the case, and my subordinates have had the same experience when we were giving lectures at Harvard University; in fact, I experienced it even more than they, for I reserved for myself the more important lectures which contained general ideas. For instance, when I set forth the necessity for collaboration between the

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infantry and the artillery, not a hearer took notes; when one of my comrades explained that the bottom of the trench was 1.7 m. below the surface of the ground, and 2 m. below the top of the parapet, or that the automatic machine rifle weighed with its case 9.1 kg., every pencil jotted down the precious information. Many fledgling soldiers consider that general ideas are too high for them, suitable only for their superiors, whereas they thirst for precise information as to lengths, distances, weights, etc., the sort of knowledge that they must possess in practical form. Consequently, when they hear that such and such insignificant details have been altered for one reason or another, they announce to all and sundry that the methods of warfare have been changed once more.

The means of effecting coördination may be epitomized in two words, information and liaison.

Coördination is, furthermore, greatly facilitated by the existence of a general training, the same throughout the army. If all the combatants are steeped in the same essential principles, follow the same general methods, and act upon the same broad lines, it will be easy to forward information at the right moment and to the right place, and liaison will be easily established wherever needed. Coördination, like specialization, is obtained by

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training; it is not epitomized in a chapter headed "liaisons," but results from the sum total of general knowledge regarding modern war.

. . .

I have tried to show what an army ought to know, before explaining my ideas of how it should come by that knowledge. This exposition has seemed to me needful for two reasons. The first is that the importance of specialization has escaped and still escapes the attention of many observers. The second is that the necessity for coördination demands a very special organization of the methods of training.

Before undertaking to study how an army should be trained, I will make one general remark. This problem of training is one of a permanent nature. It is never safe to say that any army is completely trained; new detailed processes and new machines are constantly being devised, new recruits arrive to swell the ranks, wounded men rejoin their units after a long absence, men pass from clerical to active service, etc. Finally, even when no changes have taken place, the soldiers grow slack after a long stay in the trenches, and must brush up their knowledge during rest periods behind the Front.

I shall study the problem in its most general aspect, by considering the case of an army that

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is utterly untrained. My exposition will still be true of a trained army, if account be taken of the amount of training already received.

The basis of organization for training rests upon certain extremely simple principles, so simple in fact that they seem almost self-evident. Yet, as a matter of fact they have been misunderstood in the past, and still are misunderstood to-day. They are the following:—

(1) No army can be trained without teachers.

(2) The teachers must be taught before the troops can be.

(3) To train these teachers there must be schools for officers of all arms.

(4) To organize these schools it is necessary to bring together the officers best qualified to give instruction.

These principles have prevailed, not without opposition, in the French army. Since my arrival in America I have proclaimed them from the housetops, for I am convinced that they are correct. Let me now try to explain them, and prove their correctness.

No army can be trained without teachers. This principle is evident; why is it so often misunderstood?

The people who misunderstand it are in error as to the meaning of the word "training." Training, to their minds, means drill in bodily move-

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ments and attitudes, marches and alignments, rifle practice and bayonet exercise, etc. A knowledge of these things is supposed to be enough to make a trained soldier. This mistake has been made in every army by those who believed that the military profession consisted in the accomplishment of certain rites, and not in the apprenticeship for war. Teachers whose knowledge did not extend beyond these rites could teach nothing more to the officers and soldiers confided to their care; such teachers are quite incapable of teaching modern warfare. This is the idea which so many of my friends have misunderstood when they have asked me: —

“How long a time do you think is needful to train an officer?”

I have invariably replied: —

“A few months, if he is intelligent, and put under the care of a competent teacher; a year, eighteen months, or two years if his teacher is mediocre; and in the latter case all that he will accomplish will be to lead his men to be slaughtered.”

It happened one day that a young American girl asked me just this question. I replied that I would answer it by asking her a question in turn: —

“I am going to teach you Chinese,” said I; “how long will it take you to learn it?”

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“It is a pretty hard language,” said she; “I shall need a long time.”

“Oh, no, you are very intelligent, and you will learn quickly enough.”

“So you know Chinese yourself?”

“Not a word — come on, let’s begin.”

She burst out laughing, she had understood.

It is clear that there can be no training without teachers. We come thus to principle No. 2.

The teachers must be trained before the troops can be. This principle is equally misunderstood; the reply is made: —

“We must hurry up. We can’t waste time in training teachers. Since no one knows anything, we must begin by shaping the men in the rough; after that we will look about.”

This is a dangerous error. Men who get a bad start in their training are much harder to teach than those who have received no instruction at all. First of all they must forget what they have learned, and we all know how hard it is to get rid of bad habits. It is, therefore, quite wrong to say that we save time by training the troops before providing proper teachers. In this case, as in so many others, the application of rational methods leads not only more certainly, but also more quickly, to the desired end.

I now come to principle No. 3.

To train these teachers there must be schools for

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officers of all arms. There has never existed any method of teaching literature, art, or science to a number of men, other than the creation of schools. Now, according to my favorite formula, "The present war is not a sport, it is a science." Consequently it must be taught like other sciences.

I have never believed that the fruits of teaching, except, perhaps, in the case of a spoken language, could be gathered merely by bringing together the man who knows and the one who does not. One does not learn mathematics by taking meals and playing tennis with a mathematician; the only means is by following his demonstrations, taking note of his explanations, and working out problems under his direction.

Schools are necessary, not only for specialization in each of the kinds of arms, but also for coördination and general understanding. It is a good plan to establish, in proximity to one another, schools for officers of different arms, and schools for teachers of specialties; this arrangement permits of combined meetings and reciprocal visits, which establish coördination, without interfering with specialization.

These considerations lead to the fourth principle: —

To organize these schools it is necessary to bring together the officers best qualified to give instruction.

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This principle of concentration is the antithesis of the principle which I shall call dispersion, and which consists in scattering the best teachers throughout the army, each one working for the benefit of some small handful of officers. If the best teachers be united in this way in one group and provided with the best pupils, there will quickly be formed a large number of officers capable of giving instruction anywhere.

The officers to be sent to the schools should be those best qualified to take advantage of them. These are the most mature and the best equipped, for when they return to their units they can introduce the new methods with all the authority that comes from their rank and their knowledge. If, on the other hand, it is the youngest and most ignorant who attend such schools, they will be in danger, when they return, of wounding the susceptibilities of their seniors attached to the old methods, or of being looked upon as scatter-brained or undisciplined. They will also run the risk of being unable to hand on a doctrine which is not well fixed in their minds.

The logical conclusion to draw from these principles is that in any army, instruction must begin at the top, not at the bottom. Any other system will lead to difficulties, mistakes, and delays. By centralizing instruction and entrusting it to thoroughly qualified officers, there will arise a

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uniformity of doctrine and of methods which will constitute the best liaison of all, unity of will and purpose.

. . .

How may we realize in practice a system based upon these principles? I shall answer this question by referring to the experiments which I made a year ago when the French army was facing the problem of creating schools at the Front.

The General Staff had at that time reached the conclusion that a methodical organization of training was essential, even in an army which had been fighting without respite for more than two years. This of itself is enough to show that training is an ever-present necessity.

As a result of the losses in the ranks of the junior officers, up to and including majors, since the beginning of the war, certain officers and N.C.O.'s had gained their advancement with great rapidity. They were the bravest, frequently the most intelligent; they had spent two years in the trenches; nevertheless, their knowledge was insufficient. These had to be taught, and others in turn after them, to make up for future losses.

It was furthermore needful to perfect the system of specialized instruction. As far back as May and June of 1915, the majority of soldiers

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of my army corps had shown themselves, through lack of training, incapable of using the grenades which had been distributed to them for the first time. On the Somme in 1916, the soldiers who had received automatic machine rifles had jammed the mechanism and thrown the arms away as heavy and useless.

It was evident, from these facts, that two sorts of schools were needed; schools for officers and schools for specialists. The first were required by the principle of coördination; the second by the principle of specialization.

The successful operation of such schools requires, in my judgment, two conditions, stability and continuity. Stability insures comfort, which is indispensable for the performance of good work and the installation of the necessary apparatus. Continuity insures the perfecting of details of method and the utilization of the experience acquired with the first pupils for the benefit of the later ones.

I have had a chance to ascertain in practice how true these principles are. In January, 1917, when the Sixth Army was transferred from the Somme to the Aisne, and was put under a new commander, I received an order to close all the schools and to dispose of teachers, pupils, and equipment. The army, so they said, was to deliver a decisive attack, and would need all its

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officers; what would be the use of reserving any for purposes of instruction? I tried to insist on an idea which I had at heart: since the schools constituted a permanent reserve, they could always be drawn upon if a bloody engagement deprived the units of a large number of officers or N.C.O.'s. It was all of no avail. I had to destroy with my own hands the edifice that I had erected with so much labor.

The Command later saw new light. I was instructed to start some of the schools again on the Aisne, and I succeeded, in spite of great difficulties. After a few weeks of operation, the schools were threatened once more, on the ground that the army was going to attack. I defended them with all my might, but as soon as I was ordered to America, they were once more dissolved. I have learned from correspondents that since that time it has been necessary to open the schools once more. What time and energy would have been saved if the authorities had appreciated the need for permanence in the system of training, and had respected as far as possible the principles of stability and continuity!

I do not wish to undertake a detailed exposition of the system which was in operation while I was director of training in the Sixth Army. This system, which is the same in all the French armies, could indeed be made more rational and

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more simple. In fact I had already submitted to general Headquarters a plan for its modification, by suppressing, for instance, the army corps schools, which were too unstable in consequence of changes and reliefs; and this has been adopted since my arrival in America. All I wish to do for the moment is to define in outline the official scheme of training, simplified according to my personal views.

All general ideas, principles, methods, and devices for carrying on the war should be developed at the Front. The unit for instruction should be the army, each army including a variable number of corps. The instruction should be given in army schools intended to form teachers for the army itself and for the zones in the rear which correspond to that army.

The army schools are of two sorts: schools for officers and schools for specialists.

The schools intended to train officers include: infantry schools for majors (student captains), others for captains (student lieutenants), and others for section leaders (student N.C.O.'s); artillery schools including a finishing school for superior officers and captains, and a fire school for captains and lieutenants; engineer schools comprising a school for section leaders and one for N.C.O.'s. The aviation schools are in special camps in the interior.

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The schools for specialists include infantry schools composed of one for grenadiers, one for machine-gun men, one for automatic machine-rifle men, one for 37-mm. cannon men, and one for liaison agents and signallers; artillery schools comprising a school for trench artillery, one for receiving officers, and additional schools for diverse specialties.

These schools are in the immediate neighborhood of the Front in reserved zones away from the lines of passage between the interior and the Front. They include officers and N.C.O.'s, all destined to become instructors.

In the vicinity of the army schools are the divisional *dépôts*, which are in the nature of reservoirs between the interior and the Front, to furnish reinforcements to the various divisions when needed. They have exclusively schools for infantry specialists: here the instructors turned out by the army schools train, in the case of each regiment, a number of N.C.O.'s or privates sent from the trenches or the rest camps.

Between the Front, properly speaking, along the border of which the divisional *dépôts* are stationed, and the interior of the country are found the training battalions. It is in these that training is given to recruits, to men formerly discharged who have since become eligible, and to men turned over to the infantry from other arms.

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They are established in specially reserved zones, and constitute a second reservoir, to send reinforcements, either to the divisional dépôts or to the first-line units, according to need. They have schools for infantry specialists who are taught by the instructors trained in the army schools.

Lastly, in the interior of the country are the dépôts corresponding to the regiments at the Front. It is to these that wounded men go from the hospitals after their recovery. They are then sent to the divisional dépôts, when reinforcements are called for.

Training is given in the interior in vast camps where there are schools for infantry specialties.

There is a continual passage to and fro between these various echeloned elements, so that instruction is everywhere given according to the same principles. These principles come from the army schools, which, in turn, receive them from general Headquarters.

The army schools train all the officers and instructors destined either for the training battalions, the divisional schools, or the bodies of troops of the army. They thus receive their pupils, on the one hand, from the training battalions; on the other hand, from the divisions or extra divisional units. These pupils are taught in successive groups and for a specified period; at the end of that time they return to the elements

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to which they belong. Some are meant to be instructors in the different schools of specialties, others are utilized by their various regiments in the specialties they have learned. A current account of transfers is established, even in the instruction camps in the interior; it is intended to prevent the same officers or N.C.O.'s from remaining too long outside the fighting zone. It also helps to diffuse the teachings of the army schools, not only throughout the corps of this army, but also in the interior.

An officer, usually a general or a colonel, is the director of training for the army; he watches, as a representative of the Commander of the army, the operation of the army schools, the divisional schools, and the training battalion schools. He constitutes a direct liaison between the schools for officers and those for specialists, and sees to it that the schedules include general conferences and reciprocal visits.

The officers placed at the heads of the army schools must be men of the highest merit, intelligence, knowledge, experience, and health. The value of the officers depends upon them. In the same way, officers and N.C.O.'s sent as pupils, being destined to become teachers, should be chosen with great care. To be sent to an army school is not a furlough or a rest, it is an honor involving obligations.

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Such, in broad outline, is the system which is in use in France, and which is producing excellent results. The English have adopted it; I think that it will also be adopted in General Pershing's army. So far it has not been tried in America; let us hope that some day it will be.

. . .

We have now studied the problem of training in its general outlines; let us see what solution has been found for this problem in the United States.

At the moment when war was declared, not one of the methods of modern warfare was in practice in the American army. Europe had been fighting for more than two years, but the general sentiment here was that the United States would never go to war: at any rate, no preparations were made for that eventuality. It is fair to say that there was in Paris an American military mission, composed of admirably chosen men, with whom I personally had the honor of being in contact for two or three weeks before coming to America, and who had made some studies which the American military attaché, Captain Carl Boyd, had forwarded to Washington. In fact I saw these studies in the middle of May in the archives of the Army War College. But they had produced no great effect in the army, because no one on this

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side of the water had seen the war, and no documents, however excellent, are sufficient to teach the mass of men; that can only be done by teachers.

It is to the eternal credit of Harvard University that at this time she grasped the truth. She looked upon war as a science which should be taught by those who understood it. She wished to see that science taught within her doors, for she foresaw the exigencies which the future might have in store. President Lowell requested, through the intermediary of the French Ambassador, M. Jusserand, that French officers be sent to train the Harvard Regiment. The request was granted. When war was declared the French Mission to Harvard became a means of liaison with the American army. I was thus enabled to observe carefully the evolution and realization of plans for military instruction.

From the very beginning I advised, both in my conversations with the military authorities and in my official reports, the creation of schools destined to train teachers. I suggested three different means:—

(1) Send immediately to France one hundred or one hundred and fifty French-speaking officers, to study for five or six weeks in our army schools. I believed that this plan would avoid all loss of time, and might bring great results,

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and that these American officers, with the help of a few French comrades, would form a body of teachers in the schools destined to turn out military instructors.

The objection was raised that the small number of officers in the American regular army would preclude the possibility of sending these men. But if they had been sent, they would have been back long ago, and would by now have trained thousands of others; no time would have been lost. Moreover, this plan is still feasible, in spite of the months that have intervened; all that is needed is to bring back to America some officers from General Pershing's army.

(2) Send to France a small expeditionary force, to establish, as soon as possible, army schools like ours behind the Front. These schools would train teachers for the American troops in France and in America, until such time as the schools on this side of the water should be in complete operation.

(3) Send to America a small number of French officers, chosen with the greatest care, who should, with the aid of *the best* American officers, create higher schools to train teachers for the American army.

After suggestions and negotiations whereof I know nothing, it was decided to send to this country a large number of French officers, of

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whom all but a few were, as far as I could see, specialists.

While this scheme was being considered by the higher authorities, my great personal desire was to prove to the American people the necessity for modifying the methods of military training. I wished to offer a great object lesson in modern warfare. For this purpose I had an invaluable auxiliary in Harvard University, and a marvellous means of demonstration in the Harvard Regiment.

Let me here pay my respects to those young men, who have been modest and devoted collaborators in this work for the American army. For months they worked with an intelligence, a zeal, and an enthusiasm which were entirely praiseworthy. After all their efforts, not one obtained his commission, although all had been taught by regular officers of the French and American armies. They stood by and saw their comrades, taught by the old-fashioned methods, receiving commissions at the end of three months. I felt their disappointment keenly, but I saw how the War Department could not make an exception in favor of one unofficial camp, without stirring up claims on the part of other universities. There was something very fine and very American in the way that these young men sacrificed their personal interests for



THE HARVARD R.O.T.C. AT WAKEFIELD, MASSACHUSETTS, IN JUNE, 1917
Critique by Lieut. Colonel Azan after manœuvres



THE HARVARD R.O.T.C. AT CAMP AZAN NEAR BARRE, JULY, 1917
Colonel Azan stands near the French flag in front of his tent

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the sake of an idea. And as is always the case, by being victims to this idea, they became its propagators.

As a result of all this, there gradually spread abroad the idea that something new was being taught in Cambridge, but this novelty, characterized in many people's eyes by the Fresh Pond trenches, was, to my great despair, called "trench warfare." Many persons believed that, in reality, nothing had been changed, that war was still to be learned from small manuals, such as "U.S. Military Policy," "Small Infantry Problems," based upon the battles of the Civil War or the campaigns against Indians; it was merely needful, in order to be up to date, to study an appendix called "Trench Warfare."

The idea was wrong, but it produced a most happy result. The War Department sent to Cambridge five hundred and fifty reserve officers, majors, captains, and lieutenants, who had just received their commissions at the various training camps, in order to complete their training under the direction of the French Mission. These officers arrived immediately after the dissolution of the Harvard R.O.T.C. They gave themselves the name "Iron Battalion," by analogy from the famous French "Iron Division" in whose ranks I had formerly been wounded.

The first school for teachers was founded. It

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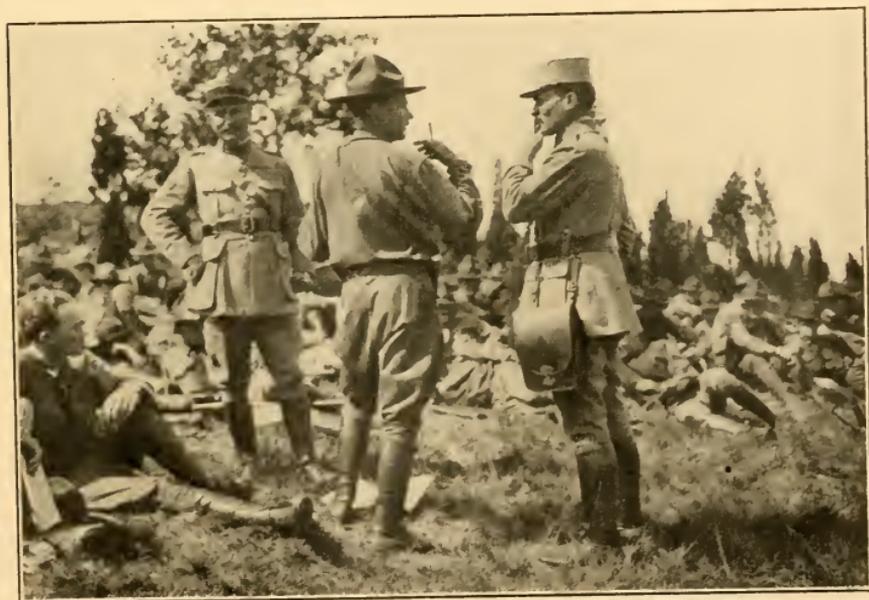
was called by the newspapers, and by certain official personages, "School for trench warfare"; but this inappropriate title was corrected by "Iron Battalion," and most of all by the fact that our American comrades were learning many things besides the method of digging a pit or constructing a shelter. A group of five French officers, without the help of American instructors, were able, in four weeks, to train five hundred and fifty American military teachers. They were not a finished product, of course, but they were in possession of a consistent body of knowledge and ideas. These teachers were in a position to diffuse everywhere the principles which they had learned.

The school was closed as a result of a new scheme of organization, growing out of the arrival of a large number of French and English officers and N.C.O.'s. These officers will be sent in groups of ten to each of the divisional camps; they will go solely to teach their specialties. The English will teach five of these specialties — the machine gun, the light trench mortar, fencing and bayonet exercise, liquid flame and asphyxiating gas, and sniping. The French will teach five other specialties — artillery, the automatic machine rifle, hand and rifle grenades, liaison service, and sapping. The coördination between the English and French in each camp



THE IRON BATTALION MANŒVRING BEFORE GENERAL HODGES, U.S.A.

Left to right: Aide-de-Camp to General Hodges; Captain Solbert, U.S.A. of the Iron Battalion; General Hodges, commanding at Camp Devens, Massachusetts; Captain Amann of the French Mission; Lieut. Colonel Azan; Captain Nicholas Roosevelt, U.S.R., of the Iron Battalion



THE IRON BATTALION ASSEMBLING FOR THE CRITIQUE AT WAVERLEY MASSACHUSETTS, SEPTEMBER, 1917

Standing, left to right: Lieut. Colonel Azan, Captain Nicholas Roosevelt, Captain Amann

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will be established by a group leader, as well as by certain inspection officers.

I see, by reference to the map, that the English and French officers will cover the whole of the United States. But let us not confuse geographical distribution with methodical organization. The essential question is, What may we expect to accomplish with these few hundred English and French officers and N.C.O.'s? I am told that they are going to train the American army; but how?

Are they to train the enlisted men? There are two millions of them; the task is impossible.

Are they to train the new officers? There are one hundred and twenty to one hundred and fifty thousand of them; still an impossible task.

Are they to train military instructors? It is the only feasible plan. But in this case we must make groups of properly chosen teachers and start schools.

I am absolutely convinced that this last method will force its way in the end, for truth always triumphs eventually. But when? Time flies, and time is precious. Each week of war costs us thousands of lives and millions of dollars. More than that, the loss of a few weeks may bring on the season of bad weather and prolong the war for a whole year.

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I often hear people say: "The troops will be trained later in France."

Why not train them on this side of the water? Are we sure that there will be enough ships to transport them rapidly? And while waiting for these ships, are we going to train them not at all, or, at most, train them badly? They will then need several months in Europe for the final grooming. Why not train them here?

I am no pessimist, I have absolute faith in the future of America. She is sometimes slow in finding her path, but, once found, she follows it with headlong speed; she will overcome every obstacle with irresistible force.

What I desire is that victory should be bought as cheaply as possible. The American army must profit by the experience of the English and the French armies. The blood of the men who fell by hundreds of thousands in the first months of the war, because neither they nor their commanders were properly trained, must not remain a vain sacrifice.

"We never profit by the mistakes of others"; so runs an old proverb. This saying must be proved wrong, at least in the case of America. I have seen all the friends of my childhood lose their lives in France; now I do not wish to see the death of my American friends also.

There is on the flag of our school at Saint-Cyr,

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the school where I was trained, a device which I have always admired: —

“Ils s'instruisent pour vaincre.”

Let us think on this device.

I know another, very noble in its exaltation of the spirit of sacrifice: —

“Mourir pour vaincre.”

This, however, is by no means intended to exalt the profitless sacrifice of lives, valuable to home and country. In place of this device I propose the following, which is the very consequence of training: —

“Vaincre sans mourir.”

III

THE TRENCHES

LECTURE OF OCTOBER 29, 1917

SUMMARY

Relative importance of trenches in the present war. — The stay in the trenches corresponds to the period of stationary fighting in the war of positions.

Description of the ensemble of a system of trenches. — Creation of the trenches: their defensive rôle; their offensive rôle. — Difference between the war of positions and the war of sieges. — The position. — Plan of organization: view of the ensemble and sense of continuity; nothing provisional. — Various elements of the system.

Detailed study of a system of trenches. — The first-line trench; continuity; interior shape; loopholes, traverses, etc. — The doubling trench; transversal trenches: characteristics and aims. — The support trench. — Machine guns in the trenches. — *Boyaux*: the difference between them and trenches; tactical aim, form, policing. — The line of redoubts. — Various works: shelters, latrines, command posts, observation posts, telephone posts, first-aid posts, *dépôts*, *places d'armes*, observing-stations. — Rear of a position: camps, hospitals, *dépôts* of matériel, roads, railroads.

Life in the trenches. — Existence organized but not minutely regulated. — Combat and work. — Distribution of effort and specialization of workmen: riflemen and grenadiers; observers and watchers; patrols. — Local rules for the trenches. — The commander in the trenches: necessity for his presence.

The liaison. — Means of information: ground and aerial observing stations; liaison officers. — Means of transmission: telephone, telegraph, runners, signallers, etc. — Regimental bulletin of information; newspapers; books; letters; godmothers.

Supply and relief. — Supply of food. — Kitchen and cooks. — Supply of munitions and matériel. — The relief: initial reconnaissance, execution. — Stay in the rear of the front.

Rôle of the trenches in the daily life of the soldier. — Their different aspects. — The numberless graves. — A monument for the future.

“THE trenches.” These words stand in the eyes of the public for the sum total of warfare.

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This is sometimes the case even with military men, the proof being the unceasing succession of books and articles bearing the title "Trench Warfare," written with the intention of describing warfare as it is to-day. The fact is that the details of the construction of trenches or the incidents of life in them are supposed to epitomize modern war. How often have I heard the following course of reasoning: "These young men are first going to learn the soldier's trade; after that they will learn trench warfare, in order to know everything necessary to beat the Germans." In this view trench warfare appears as a special chapter appended to the old one which dealt with the war of ambush and of movement.

Now, modern warfare, on the contrary, is based on certain general conceptions, and without a knowledge of these it is impossible to understand its particular aspects. When once modern warfare is understood, all other wars are understood likewise, for they are but simplified examples. It is a mistake to say that there are different sorts of warfare according to different theatres of operation; it is merely that there are wars where one side is less well armed, or insufficiently supplied with artillery, aircraft, or engineers. In such a case victory is more easily won, and war takes on the aspect of a man hunt.

I am told sometimes: "War is not the same

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in Russia as it is in France; in the former country cavalry is used." There are, indeed, differences, but they are not differences of principle. The fact is that the Russians have often been short of ammunition, through the fault of their administration; it is also true that the Russian army has, at this moment, a diminished morale. When the day comes that Russian affairs are honestly and efficiently administered, and the morale of the army is restored to its former excellence, then they too will wage a war of positions, and will contribute to the final victory. If not, they will not fight any more at all.

The trenches represent no more than one aspect, or, more properly, one method, of modern war, the method suited to the period of stationary fighting, where the combat is not active. The two adversaries watch one another, and prepare, and wait.

One day Major-General Edwards, with whom I was talking, said to me laughingly:—

"This is a miserable kind of war; it is warfare in the sewer."

"General," said I, "we certainly do have to hide in the sewers until it is time to come out. True warfare begins when we do come out, and that is the sort of warfare which I hope we shall wage side by side."

It is nevertheless true that a study of the

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trenches is essential. I propose, therefore, to give, in turn, a general description of trenches, a detailed account of their different parts, and a bird's-eye view of life therein.

. . .

The first trenches were constructed when the infantry, halted in its advance, was obliged to dig in for protection against the fire of artillery and machine guns. They were, first of all, a sort of long ribbon, stretched along the front of the armies as a protective barrier; later, as this barrier seemed too insecure, other trenches were dug behind, till a whole system was established. This system has, little by little, become so strong that the object of each of the opposing armies is to destroy it at one or more points, in order to get at the other army.

A nation which, in time of peace, had constructed such an obstacle all along its frontier, would have been safe from a surprise attack. And yet we used to make fun of the Chinese who formerly built the Great Wall of China to defend their borders, as well as of the French officer who, at the time of the conquest of Algeria, proposed to defend Algiers by a continuous trench!

We should never forget that the trenches have an offensive as well as a defensive function. If they are a means of stopping the enemy from

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passing, they are also a means of clinging to the terrain, in order to advance.

This offensive function of trenches has often given rise to a false idea, namely, that modern warfare is really nothing but siege warfare. Now our present trenches do not, in the least, fulfil the same rôle as those used in a siege. When we advance, we are not, as in a siege, endeavoring to reach a specific objective, the conquest of which will bring victory. What we endeavor to reach is the enemy's army. Even the capture of his capital, which may be looked upon as the final goal towards which all trenches lead, will not give the victory if his army remains intact. The capture of trenches to a dozen miles in width, or even to a dozen in depth, is nothing but an unimportant geographical gain, if unaccompanied by the capture of many prisoners and many cannon.

It is true that siege warfare may appear here and there in special instances, such as the attack on an important point of support, or on an observing station affording a wide view; in this case all of the usual siege methods, such, for instance, as sapping and mining, are brought into play. Here each gain of ground brings the desired objective nearer. But in the general case the trenches do not really bring us closer to the goal; they merely afford shelter while awaiting the attack.

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Trenches are grouped in systems, of which the most extensive is called a "position."

A position is divided into "centres of resistance," each including one or more "points of support." These latter correspond to geographical configurations suitable for purposes of resistance; they must, however, always be organized with a view to camouflage, so as not to catch the eye of the enemy's aviators, or become a target for his artillery.

The trenches of a position are divided, for purposes of garrison, into sectors and sub-sectors. These are arbitrary partitions, corresponding to military units such as divisions or regiments; their size is variable according to the density of occupation needful at that point.

The organization of a position should be carried out according to a definite plan, which considers both its offensive and its defensive function. This plan includes two parts, plan of defence and plan of attack.

It is essential that a commander who draws up such a plan should have from the outset some comprehensive idea, and that, in carrying this out, he should follow a methodical procedure. These conditions have not always been realized, because too many officers have had a part in laying out the trenches, and the multiplicity of schemes has further been complicated by reliefs. The

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outermost line of trenches, that is to say, the first line, is determined by the accidents of the combat; it corresponds to the line where the most advanced combatants were halted. It is sometimes needful, for the sake of the general good, to modify this line at some points, however excellent it may be for local purposes. Yet no one but the commander of the position, thoroughly conversant with the whole plan, should order such a modification, even though it should be the means of saving many human lives. To this end it is essential that a permanent body, in charge of the organization of the trenches, shall be constantly on hand, independently of reliefs, at the post of the commander of the position, or at least that the plan adopted by any commander shall not be modified by his successor.

For example, in Belgium, during March, 1915, at Passchendaele, where I commanded a centre of resistance, one of my company trenches was seriously exposed to the enemy's artillery, and was, furthermore, enfiladed by the machine guns and rifles of several of the opposing trenches. A modification of this outline, to which my superiors agreed, would have improved the situation. But my trench was next to one belonging to another army corps, whose displacement would have been involved. Moreover, in the trenches on the one side and on the other, at

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different dates, there was a relief every four days, and this involved a change of commanders and of units. No agreement could be reached before I left that part of the Front. I lost, during my stay at that centre of resistance, more men in the condemned trench than in my other three trenches put together.

In the construction of trenches, as in everything else appertaining to war, it is an essential principle to avoid temporary measures. Many a mischance has come to those who ignored this principle, whether in the construction of light first-line shelters, or of factories in the interior. Some officers contended that since the trenches were a temporary expedient, they should be hastily constructed. "What is the use of doing more?" said they. "We shall leave soon and move on." They have been in those trenches for the last three years.

The same reasoning that was used by a friend of mine when he saw the beginning of the construction of an ammunition factory in July, 1915: "It is ridiculous to build a factory now; the war will be finished before the factory is." The factory has been turning out ammunition for more than a year; the war is likely to be with us for some time more.

Still, this same reasoning was offered to me in January, 1917, when I was warmly defending

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the principle of schools for the army: "What is the use for teaching now? This is the decisive moment; every one must join in the combat." After our offensive had been checked, the schools had to be brought into being again, and officers sent to them to be trained.

I dwell on these mistakes which have been made in my country, not to belittle the value of its efforts or the merits of its leaders, but to save America from falling into the same errors.

The plan of organization of a position is, above all, based upon common sense and tactical considerations; it can afterwards be modified according to local circumstances. It is important not to prescribe invariable rules, nor to stipulate certain measurements for every case. Still, we may assume that every position includes the following elements: —

(1) A first-line trench which is continuous, preceded by listening-posts and protected by accessory defences.

(2) A doubling trench (sometimes miscalled a "cover trench") fifty to one hundred yards behind the first-line trench.

(3) Transversal trenches, varying in number.

(4) A support trench, five hundred to eight hundred yards behind the first-line trench.

(5) A line of redoubts (sometimes miscalled "reserve trenches") not continuous, which is often

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used both to stop the enemy's advance and to protect important groups of artillery.

(6) Boyaux, running from the rear up to the first-line trench, and serving for communication between the various trenches which are, with the possible exception of the transversal ones, roughly parallel to one another.

(7) In the different trenches, and between them, shelters for the men, command posts, observation posts, dépôts for munitions, food and water, first-aid stations, *places d'armes*, to collect the troops, etc.

Thus a subterranean city is dug out little by little, echeloned in depth, and continually improved in point of comfort and security.

. . .

The first-line trench has usually an initial outline determined by the chances of the conflict; this outline can be made conformable to the accidents of the terrain, but is not restricted by any fixed principles. A field of fire of about one hundred yards in front of it is sufficient; the ground beyond ought to be easily covered by friendly artillery. There is advantage in placing the first-line trench on the farther side of a slope, as such a location insures the possession of good observing-stations.

The first-line trench is a firing trench; it is also

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used to observe the enemy. The accessory defences are in front of it; they are composed of networks of barbed wire, attached to posts, chevaux-de-frise, and other obstacles wherewith to stop the enemy's advance. They are forty to fifty yards from the trench, enough to prevent a simultaneous adjustment of the enemy's artillery upon these defences and upon the trench, and to afford protection against liquid fire.

Listening-posts, reached by boyaux, and used at night, are constructed wherever it seems necessary to have a means of closer observation or more effective system of flanking fire.

It is essential that the first-line trench be continuous. This is needful, both to secure lateral liaison, and to insure the defence of the position. A point which seemed completely protected, for instance, by a swamp, would be secure no longer in summer when the swamp was dried up by the sun, or in winter when it was frozen hard.

It is possible, in such a continuous trench, to have certain points occupied only by watchers here and there. In fact the first-line trench is, on principle, but lightly occupied by the defenders. But there should never be absolutely passive zones; that is to say, zones with no trenches at all, protected solely by accessory defences and flanking fire. If the accessory

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defences were destroyed by artillery, and the flanking fire neutralized, a road would be open to the enemy. Furthermore, a counter-attack would be without shelter, and the defenders of points of support isolated, without means of succor. Such points of support become "bomb-nests" from the fact that they are clearly visible to the enemy's aviators.

The interior form of a trench depends upon the purpose which it is to fulfil and the nature of the terrain. What is the use in saying that it should be 1.7 m. (5 ft. 7 in.) deep if, as in the Yser region, water is found at .3 m. (10 in.)? Really, in such a case, there is no trench, properly speaking. There is merely a parapet built up above the level of the ground by any available means, especially bags of earth, fascines, and gabions. During the night gangs of men bring empty bags, which are filled on the spot, and serve to form new elements of parapet, or to repair sectors breached during the course of the day. Such breaches are often numerous, for it is easy to see what a target this parapet offers to the enemy's artillery.

The loopholes were used for shooting, at the beginning of the war. This is no longer the case for the three following reasons: First, if they are numerous and visible, they attract the enemy's shots, while themselves affording a very limited field of fire. Secondly, firing against trenches is

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now the work of high trajectory weapons. Lastly, they are destroyed by the artillery preparation before a hostile attack, and so have ceased to exist at the moment when they might be of use: in fact, it is always better to shoot over the top of the parapets. They have become, for the most part, means of surveillance and observation; they are few in number, but strongly built and carefully camouflaged; and they furnish shelters sufficient to protect the observer against severe weather and against fragments of shell.

The traverses are heaps of earth about three metres in width, thrown up at intervals at the time the trench is dug; the trench goes around them in order to maintain its continuity. They effect the division of the trench into compartments which cannot be hit by fragments of the same projectile. The splinter-proofs are artificial mounds of earth brought in baskets or bags; they are constructed after the trench is dug and serve the same purpose as the traverses. When the time is lacking to build traverses, the outline of the trench can be turned back here and there to avoid over-long straight stretches. In case of an enemy attack, the traverses can be used to confine it to the section of the trench which it has penetrated. To this end bags of earth, chevaux-de-frise, or h rissons, made ready beforehand, serve to obstruct the space left free for going to

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and fro. Thus a traverse forms a barricade protecting the trench from flank attack.

In Belgium during the winter of 1914-15, the Germans made use of an ingenious scheme to decimate our assaulting troops. They dug sections of trench in the shape of a V, with the point turned towards us; our troops naturally approached the trench at this point; the two branches of the V were bordered by traverses with loopholes, which enabled them to enfilade the branches and destroy without fail all who were in them.

The doubling trench is one located some distance, generally about 100 metres (109 yds.), behind the first-line trench, where the men can find shelter, rest, and sleep. There are constructed the shelters for the troops who are to relieve the various positions in the first-line trench and to defend it in case of attack. In it are generally placed the command posts of the leaders of the platoons on duty in the first line.

In exceptional cases it is impossible to dig a doubling trench, supplied with shelters, at a suitable distance from the first line. The troops then have but precarious quarters on the line of sentries, where their rest is constantly disturbed by the going and coming of the men on fatigue duty and the patrols, by the firing and the alarms.

That is what happened to us in Belgium when

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the Twentieth Corps was in the trenches about Ypres. It was impossible, on account of the water, to dig boyaux from the first line to the rear, or a covering trench. My men of the 153d and myself could obtain no other shelters in the Langemarck sector than pieces of tent-canvas or tarred paper stretched on wooden pickets against the parapet! Less precarious arrangements could be authorized only rarely, in order that the parapet might be left clear in case of attack: the canvas could be raised instantly if the enemy were signalled, and replaced as easily, whereas more substantial coverings would have required a serious waste of time in taking down and putting up again. But one can imagine what our rest amounted to in those muddy shelters, in horrible weather. There we were, our clothes soaked by the water, without fire, without warm food, our legs either folded under us or bent up to the chin. My young men of the 1915 class made their *début* at the front in those trenches!

The transversal trenches are trenches of all sorts and all lengths which are dug behind the doubling trench. They provide for the following essentials: for echelonment in depth, which is indispensable for serious resistance; for the numerous needs of the position in works of all sorts, such as shelters, command posts, observation posts, *dépôts*, machine-gun emplacements, posts for bomb-throw-

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ers, *places d'armes*, and the like; and, lastly, for lateral communications, which cannot always be managed through the first-line or doubling trenches, without danger to those who undertake them or without throwing the occupants of the trenches into confusion. For greater facility in these communications, it is well that the transversal trenches, even when they are intended to contain but one work, as a *dépôt* or a command post, should not end at that work, but should be prolonged as far as a *boyau* or another trench. In this way they become, at need, communication trenches, which must not be confused with the *boyaux*. The transversal trenches generally contain the command posts of captains commanding companies on duty in the first line.

When the character of the terrain interferes with the digging of doubling or transversal trenches, it is well to construct false ones. The advantages of this subterfuge are that it attracts a large part of the enemy's artillery fire to these false trenches, and that it does not permit him to detect the weakness of a tenuous first line.

During the winter of 1914-15 our lines in Belgium had a very slight power of resistance, just by reason of the absence of doubling and transversal trenches. Let our immense semi-circle be pierced by an enemy attack at any point whatever, which was relatively an easy matter, and the

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adjoining parts of the line would be taken in the rear and our front would have to be rectified in haste. But our foes, who had almost everywhere a better terrain than ours, were not destined to learn the precarious state of our positions. Behind our first-line trenches there were numerous old and abandoned trenches, both German and French, which had the appearance, at a little distance, of a complicated system. As their location often made them more visible, the enemy artillery would concentrate its fire on them for hours continuously, to our great delight. This was the case in February and March, 1915, in the centre of resistance at Passchendaele, where I was in command, and especially on the hill of Gravenstafel where my command post was.

At Langemarck, where I had been a few weeks before, the French High Command had taken note of the danger of our situation. Thinking, doubtless, that the situation could not be bettered because of the lack of labor, it sent, without any request from me, a gang of men to dig doubling trenches during the night. These trenches instantly filled with water to the brim and were never used; but they were of great service to me at a time when the artillery became very active, by attracting almost all the projectiles.

In the offensive, doubling and transversal trenches assist in bringing together, at the trench

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from which the start is to be made, the units which follow the first assaulting troops; they provide them with shelter and prevent them from getting crowded. Thus, at the time of the offensive movement of May 9, 1915, in Artois, three battalions of the 26th Infantry, which formed the first three "waves," were able to form in a space of little depth, thanks to the system of trenches developed in the Écurie sector. Then, when the first two waves had broken against the machine guns and rifles with which the Labyrinth front was bristling, my battalion of the 69th, assigned to form the fourth wave, executed with great ease a lateral movement, to debouch at another point in the line, and the battalions in reserve were able to take their places at once. There was a perfect maze of deep trenches and strongly built shelters there, making it possible to keep several battalions in close proximity to the theatre of the battle, in relative safety.

In the defensive, doubling and transversal trenches not only have the advantage of affording shelter to the eventual defenders of the first line and saving them from useless risks or fatigue; they also facilitate manœuvres through the boyaux, to envelop the enemy in case he should have penetrated portions of the front line. In Belgium, in December, 1914, my company of the 153d was occupying a trench that formed a

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salient, on a little hill beyond the Strombeck Brook. Thanks to the character of the terrain, I had been able to dig a doubling trench — the only one, I believe, in the whole region at that time. The Germans, who were a very short distance away, held a boyau that reached to within three metres of my first line, and seriously threatened a section of trench. I had lateral boyaux dug by which the men resting in the doubling trench could envelop the limited front on which a surprise attack was possible. However, I was simply copying a manœuvre by means of which the Germans had inflicted considerable losses on us on several occasions; for instance, at Saint-Julien on December 11, 1914.

The support trench has for its object to check the enemy in case the first-line and the transversal trenches should be penetrated. It is intended not only to constitute an obstacle, but also to shelter the troops who are to make a counter-attack or a return offensive. Its location is fixed by the plan of organization. It should be selected in such wise as to place the trench beyond the range of the enemy's barrage, which, when an attack begins, seeks to isolate the front trenches from the interior of the position. It is from 400 to 1000 metres (440 to 1100 yds.) from the first line. If it can be on sloping ground it has a great advantage. It is in this trench, when

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it is not too far away, that we find the command posts of the battalion commanders whose battalions are in the front line.

The transversal trenches, like the support trench, are of such a nature that troops stationed in them can, by their fire, check the enemy's advance; they are, therefore, with the exception of some transversal trenches, arranged beforehand for rifle fire and for throwing bombs; they are even supplied often with accessory defences.

On the Yser, in 1914-15, although it was impossible to construct boyaux, we managed a few transversal and support trenches. At Lange-marck, for example, as they could not be dug in front of the village, both because of the enemy artillery and because of the nature of the soil, they were placed behind it. I constructed and occupied several, between Langemarck and Pilken, to block the road to Boesinghe Bridge; they were all swiftly transformed into canals in December, 1914, and January, 1915. For this reason the local commander caused to be constructed, by the engineer corps assisted by laborers, on a more favorable terrain a magnificent system of trenches which almost constituted a second position, by virtue of its distance from the first line as well as its strength. Its course passed near Pilken and Wieltje, and covered the approach to Ypres as well as the bridges over

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the Yser behind Langemarck and Saint-Julien. The troops sent back temporarily to rest, about Ypres and Boesinghe, had to learn its location without delay, so that they could resort to it in case the first line was attacked. We had no means of knowing what part these trenches had played when, a few days after our departure, late in April, 1915, our successors were attacked with asphyxiating gas ; we thought they ought to suffice to prevent the approach to the Yser Canal.

The machine guns must be echeloned in depth, in order to insure the defence of the position. They are not numerous in the first line, where they are too often in danger of being injured or destroyed, and where they have no chance to take part except in case of an enemy attack. They are, therefore, for the most part, echeloned in the transversal trenches. They are placed behind stout and invisible shelters, from which they emerge only in case of necessity. Their rôle is to intervene mostly by a flanking fire and by surprise; they should have well-defined zones of action so as to produce sure results.

In the first line their firing-stations are arranged beforehand; but as these emplacements are often knocked out by the bombardment, the machine guns may be stationed, when the time comes, at any favorable point — a section of trench or a

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shell hole; they are often more advantageously placed in the latter than elsewhere, in view both of the effectiveness of their fire and of their own safety.

The machine guns echeloned in the transversal trenches are placed there to close all important avenues of passage, such as ravines, bridges, cross-roads, open stretches, and every sort of place when the enemy is obliged to approach on a narrow front. They are stationed sometimes in casemated embrasures, provided with accessory defences, where their crews hold out to the last moment: a sheltered boyau or subterranean passage makes possible the removal to the rear of crew and equipment. The machine guns in support trenches are placed in salients which can bring a flanking or enfilading fire to bear on those parts of the terrain by which the enemy may advance.

Although some of the machine guns are not much employed except in case of an irruption of the enemy into our positions, they ought always to have their full complement of men and to be in perfect working order: these conditions are insured by practice in response to sudden alarms. In fact, machine guns may absolutely arrest an enemy offensive if they intervene quickly and boldly.

Machine guns are often grouped in regular

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batteries, which are used like batteries of artillery. They may deliver a barrage fire in case of an enemy attack. They may also cause great harm to the enemy every day by executing indirect fire on tactical points which are much frequented by the enemy or otherwise important. The indirect fire is carefully adjusted like artillery fire.

The boyaux are built to connect the various trenches with one another and with the rear; they are used for reliefs, reënforcements, bringing up supplies, evacuations, and communications. Their general direction is at right angles to the first-line trench and to the general trend of the others.

They differ essentially from the trenches in that they are simply media of communication, instead of being elements of fighting and of shelter. A body of troops should never be stationed in a boyau except in case of absolute necessity, whereas they live in the trenches proper, and fight there. The very purpose of the boyaux requires that they be clear of all impedimenta: therefore no one must be allowed to dig shelters, individual or collective, along their walls, or holes for material, munitions, water, or provisions, which would entail very serious obstacles to free movement. To provide places for such matters transversal trenches should be dug.

In defensive fighting, if the trenches are over-

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run, the boyaux become, by exception, fighting ground; by the chance of events, if the enemy forces his way into a certain zone, the uninvaded boyaux near by become actual trenches; but it would be useless labor, and a mistaken policy, to transform beforehand a boyau into a trench capable of firing or supplying defences on either side. Only by barricades constructed at intervals and by platforms for bomb-throwers and machine guns echeloned in the transversal trenches will the enemy's advance be held in check.

One must think first of all of the daily service of the boyaux, which is to facilitate communications from the front to the rear and *vice versa*; and of their rôle during offensive fighting, which is to facilitate the progress of reserves to the front. The boyaux must be left free to serve these purposes. It would be easy for me to cite many examples in which neglect of this principle has delayed the coming up of reserves and consequently has endangered the success of an attack.

The interior form of the boyaux is not the same as that of the trenches. The boyaux are theoretically deep and narrow, so as to protect as much as possible the troops passing through against the effects of the fire of the enemy; but their dimensions depend largely on the character of the terrain.

The outlines of the boyaux are not always the

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same, varying according to the use for which they are intended. Those for bringing up troops are not built in a straight line, in order to avoid being swept by an enfilading fire; they follow a zigzag course sufficiently marked to afford a natural protection and to form compartments. On the other hand, the evacuation boyaux, which have to afford easy passage for a stretcher with a wounded man, or even for Décauville cars, must have a shape and width adapted to this rôle.

In ordinary boyaux, where their narrowness makes passing in opposite directions difficult, it is well to make recesses at intervals, so as to allow troops to pass, or to rest, or to set down wounded men.

Furthermore, regulation of the passing to and fro is necessary. To this end a scheme of direction may be fixed upon, certain boyaux being used for going to the front, others to the rear. Signs are posted, with arrows to indicate the direction, and, if necessary, sentries see to it that the orders issued are obeyed. When the number of boyaux is too small to permit uninterrupted circulation in both directions, the movements have to be governed by signals or by sentries, as on single-track railways; but, above all things, new boyaux should be dug as soon as possible. When the demands of the Front take precedence of all others, as for example in offen-

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sive fighting, then all the boyaux may be used for passage to the Front, except those reserved for evacuation; in such case the direction of the arrows is changed wherever it is necessary, and the sentries are notified.

The main boyaux bear a simple name from their beginning at the rear to the first-line trench. Secondary boyaux branch off from them, more and more numerous as one approaches the front; at each fork is a sign bearing the name of the secondary boyau and that of the trench to which it leads; the names, letters, or numbers by which the boyaux and trenches are designated, are shown on the battle maps. The signs — and, at night, lanterns suitably placed — should enable one to find readily, even without the help of a battle map, units, command posts, or dépôts of any sort. Sentries are posted at all important forks, in shelters which do not impede circulation.

In certain districts the character of the soil prevents the digging of boyaux. Such was the case in the Yser region. There the boyaux were simply routes carefully selected; they were marked by boards placed on fascines in swampy tracts, or thrown over ditches full of water; sometimes, indeed, they were simply laid on sticks, or stakes bearing telephone wires. When you stepped aside from these paths, which were

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bad enough, Heaven knows! you were mired in ditches, shell holes, or swamps. It was impossible to cross those open spaces except at night. When telephone men wishing to repair their lines, or *agents de liaison* carrying orders, ventured upon them in daylight they risked their lives every minute.

Behind the support trenches, and sometimes confused with them, are redoubts, intended to offer a particularly stout resistance to a hostile attack. These redoubts are not necessarily isolated works; they are arranged along a line known as the "line of redoubts"; it is not a continuous line, but it includes sections of trench, or nests of resistance, together with machine-gun emplacements.

The line of redoubts, or, in default of it, the line of trenches which takes its place, has received the name of "covering line" for artillery. This official designation has one disadvantage: it may lead to the belief that the artillery is disposed on a line, or, at all events, echeloned from a fixed line as a starting-point; and even that this echelonment depends on the range of the guns. Nothing of the sort is true. Pieces of artillery may be placed, both for offensive and for defensive work, even in front of the support trenches. As for their calibre, that depends not on their distance from the enemy position, but

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from the part allotted to them. We must understand, then, by covering line for the artillery, the line of trenches or redoubts which covers the most numerous assemblages of guns echeloned behind it.

Companies or battalions belonging to the same units as the companies or battalions of the first line are given the task of occupying these works, and are held there in reserve. For this reason the latter are sometimes miscalled "reserve trenches."

The command posts of colonels are usually placed near them.

A system of trenches is, as will be seen, a complicated whole, subject to certain general principles and laid out according to a complete plan which is not held down to any fixed rule. Common sense and ingenuity are, in many cases, the best guides in deciding upon this system. By the same token, there are no rules for echeloning units in depth; we must give troops as much rest as possible, while making sure that the position is properly guarded and the different services properly attended to. Nor are there any rules for the distribution of men in the trenches, or for the duties assigned to them. There are none, either, as to the necessary ratio between machine guns and artillery, or as to the method of echeloning the guns, etc.

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The trenches contain a great number of items, such as shelters, latrines, command posts, observation posts, telephone posts, first-aid posts, dépôts, *places d'armes*, observing-stations, and the like. Neither the shape nor the location of these various things is subject to fixed rules. It would be at once foolish and hazardous to undertake to determine beforehand dimensions, depths, thicknesses, or topographical conditions.

At most it is possible to lay down for them a certain number of conditions, sometimes contradictory, which commanding officers, in their different ranks, should comply with so far as they can, taking into account the dispositions of the enemy, the circumstances of the moment, and the terrain.

The shelters for the use of the men should theoretically be buried so as to withstand heavy shells. They may be hollowed out like caves, with an overhead protection the thickness of which depends on the character of the soil — about six metres in unworked land. They may also be dug without a covering, then covered with a roof made of earth and round posts or rails; these last can be dug more rapidly than the caves, but they also collapse more easily.

However constructed, shelters should always have several entrances, two at least, in case one is blocked by bombardment, and to facilitate

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communications. These entrances are protected by doors of water-tight canvas, or, failing that, by coverlets saturated with hyposulphite as a protection against gas. The shelters should not be too large, so as not to expose too many men at once; they are always supplied with spades and pickaxes.

The light shelters are intended simply to put the men out of reach of fragments of shell and bad weather; they should not be so built as to weaken the parapets or to make their defence more difficult. They are sometimes nothing more than sheet-iron plates, curved or corrugated, and covered with earth.

The latrines are generally dug in small transversal trenches with a single exit; they should be rather numerous and kept in perfect condition, so that the sanitary condition of the trench may be perfect.

A command post should comply with this condition above all others — it should be located near the observation post of the officer for whom it is intended. It should be easy of access, and easily found by means of the signs posted in the boyaux. Steps are taken beforehand to provide for the speedy destruction of all papers in case it should be necessary to evacuate the post under pressure of the enemy.

An observation post is generally not single;

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it should be double or triple, as well to afford a field of vision, which a single one does not always afford, as to lessen the effect of artillery fire aimed at one of them.

Telephone posts adjoin the command post or the observation post; they are always supplemented by optical posts which can be substituted for them instantly.

The first-aid posts are placed near the evacuation boyaux and in locations as quiet and well sheltered as possible.

The dépôts for munitions, food, and water are so placed as to be easy of access to all units and not to impede circulation when they are in use; they are generally in shelters similar to those constructed for the men, but of larger capacity.

The *places d'armes* are intended to make possible the assembly of reënforcements or reserves during a comparatively short time, near the first-line trenches; they are supposed to comply with two contradicting conditions — to keep the different units from scattering, and to avoid too much massing of the men. They are either formed by transversal trenches assigned temporarily to that use by the commander, or are specially constructed for the purpose.

The rear of the position is the locus of a large number of items which are indispensable to the welfare of the Front.

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The camps are to provide shelter, back of the Front, for troops in reserve or resting. They are made up of wooden huts, or, failing these, of tents; they always include sheds for the horses, for whom some degree of comfort is indispensable if a heavy mortality among them is to be avoided. These camps are especially numerous in districts devastated by the war and in those where there are large numbers of troops. They must be built rapidly by companies of engineers specially trained for this work.

Hospitals and infirmaries are in places carefully selected as being as healthful and quiet as possible. Those nearest the Front, for example those for wounded who cannot be moved, or for those awaiting the despatch of sanitary trains, are either in wooden huts, or in special tents, or in houses adapted to the purpose. The removal of the wounded is guided by the twofold principle of not sending into the interior men who are likely to return to the Front without a period of convalescence, and of not encumbering the Front with wounded or sick men who need long-continued treatment.

The dépôts for matériel are built at points which permit the receipt, storage, and distribution of matériel of every kind.

The roads are an essential item, and their up-keep demands constant attention, especially

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when there is a considerable circulation of heavy motor vehicles. The railways are managed by their ordinary professional personnel, but are under the control of a military director of railways, who issues all orders relative to the transport and provisioning of the troops, through the medium of the railway service officers. On the wise handling of the roads and railways depends the arrival of troops at the proper time, the regular supply of provisions, and of a sufficient stock of munitions — all of which are essential conditions of victory.

. . .

Life in the trenches is not the same throughout the zone in which there are trenches. When one passes from the first-line trench to the support trench, or from the latter to the headquarters of the division commander, the scene changes, occupations vary, the atmosphere is different.

Genuine "trench life" should be studied in a forward part of the position, that is to say, between the first-line trench and the line of re-doubts.

It is an existence which is strictly regulated without any rules providing for the employment of the troops hour by hour. There is no fixed time for getting up, for meals, or for sleep; there is

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a fight to be fought, and works to be constructed; there is unceasing activity to be distributed among the occupants of the trench. The duty is always done by reliefs: this term is applied to the watcher or observer who is replaced by a comrade after an hour or two of service at his post; it is applied as well to the small unit in the first line, to the division, or to the army corps, which, after a turn of duty of variable duration, is withdrawn from the trench zone and sent to the rear to rest and reorganize.

Life in the trenches is summed up in two words: fighting and work.

The fighting, although it has slackened somewhat, is continuous; it has its surprises, its hazards, its heroisms. The enemy, with his bombardment, his grenades, his mines, tries to destroy the trenches, to make them untenable, to inflict heavy losses. The occupants of the trenches do the like as to him; the lookouts are alert; the trench-gunners do their best to destroy, with their heavy projectiles, the important points in the enemy's position — observatories or machine-gun shelters.

In this incessant duel the strokes of chance are frequent.

Sometimes an *agent de liaison* arrives at the command post.

“So-and-So has been killed.”

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“What? I saw him less than an hour ago.”

“True; but when he left you he took Boyau K; on *Cote 207* a shell came along—and there you are!”

“A bad corner, known and marked.”

This is the every-day dialogue. They go out to investigate: against the blood-stained wall of the trench they find the mangled remains of a comrade. The next day, however, it will be necessary for others to pass through the same place which they know to be deadly.

The work, too, is never-ending. The trench requires labor without respite, night and day alike. The least relaxation of effort has to be paid for; first of all is the inrush of water, then the undermining of the walls which fall in huge masses, collapse of the shelters, burial in the ruins, and sometimes death.

At nightfall the trench becomes a vast lumber-yard, a veritable factory. The gangs which could not go about by day bring to the first line the necessary matériel: posts, boards, wire, bags of earth, gabions, hurdles, corrugated sheet-iron, gratings, fuses, boxes of cartridges and grenades. All of this is impatiently awaited. It must be forwarded with great care, to make sure that nothing is destroyed or wasted or lost. Workshops are set up in the darkness, often in the mud, sometimes amid falling projectiles. Here a

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new trench must be dug; yonder a boyau must be prolonged or another one made.

If an offensive movement is in preparation, there are sometimes several kilometres of boyaux or trenches to be built or made over, either as lines of departure or as points of assembly, or as avenues of access or evacuation. Lastly, the enormous daily labor of up-keep and repair must be attended to; all sorts of hostile attacks on the trench must be met — the bombardment, which pulverizes it, and the rain, which overflows and destroys it.

Drainage is an urgent problem and difficult of solution. The health of the men and the safety of the trench and the shelters are dependent on it. Every infantry officer must transform himself into a hydraulic engineer, and all the privates into sewer-men. In the dampest or rainiest sections of the Front — in Belgium, Artois, or the Argonne, prodigies of toil and devotion have been performed.

Rare are the men who, not having lived this life, have any idea of the vast amount of work thus performed. How many officers are there, in the trenches, who have not received from the rear orders or advice so little consonant with the stern conditions of reality, that they have had to smile at them in order not to lose their temper!

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In Belgium one of our superior officers thought that our troops did not work as they should on the trenches. So he ordered that the company commanders should make a sketch every day, showing the projected works in blue chalk and the completed portions in red chalk. After considerable difficulty in securing the colored chalks, I was hard put to it to use them. Even on a large scale the work done would appear only as a few tiny points of which I was a little ashamed. And yet my men worked unremittingly, organized, led, and overlooked by my officers and myself. I could have increased the blue tract by projecting pretentious works; but that subterfuge seemed to me unworthy of the genuine efforts put forth by my brave troops.

To make our task easier, we received some invaluable bits of advice. A zealous staff officer sent us a prescription warranted to bring about the best results: he informed us that one third of the men should keep watch at the loopholes, while another third applied themselves to the works, and the last third rested. One can imagine the reception that this scheme, worked out in a comfortable office, met with when it was communicated to the denizens of the trenches, whose rest was more than uncertain and whose lives were constantly in peril.

The organization of the service, which is end-

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lessly variable according to the circumstances of the moment, must be left to the initiative and conscientiousness of the leaders of the small units. The essential thing is that every one shall work.

They must work because, if the men's minds are not kept constantly on what is in front of them, they will inevitably get to thinking of the rear. The idle man in the trenches sees nothing ahead but his "relief," and this anticipation inhibits any sort of effort. Idleness becomes the mother, if not of all the vices, at least of cowardice and faint-heartedness.

They must work, too, because, even in the "quiet sectors," they must envisage the possibility of an offensive against the enemy, which means preparatory labor; also, the hypothesis of an enemy attack, which demands the constant strengthening of the defensive works.

The principles which govern the work are distribution of the effort put forth and specialization on the part of the executives. The soldiers in the trenches have tasks common to all, such as building earthworks, keeping the shelters in repair, and "fatigue" jobs; but a certain number are given special work according to their individual capacities, and are employed as "snipers," as observers, or as patrols.

All of the men must know how to fire a rifle or

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to throw a grenade; among them there are picked shots and picked grenade-throwers, to be employed in certain cases. In addition, there are men drilled in firing V.B. grenades, in firing trench-mortars, in the indirect firing of machine guns, and in handling jets of burning oil, etc. During the first months of the campaign, the only firing was with the rifle, through loopholes; now the methods of firing are manifold.

Not only does the firing interest the men and give them practice — it also occasions very considerable results in the way of loss to the enemy. I was never tired of repeating to my men on the Front this argument: "If a company by dint of unceasing watchfulness succeeds in putting two Germans hors de combat each day on a front of 400 metres (which is about its scope), that will make five men put out each day on a front of one kilometre. Assuming that the French Front covers 600 kilometres, there will be 3000 Germans accounted for each day, and 90,000 a month. If the artillery achieves a like result, there will be 180,000 Germans hors de combat each month, even without a serious engagement."

In this respect the Germans set an example of successful patience and watchfulness. The first wound I received in that campaign, although trifling, is a proof of this. It was on Janu-



FIRST-LINE TRENCH NEAR YPRES EARLY IN 1915. A WATCHER



FIRST-LINE TRENCH IN FRONT OF LANGEMARCK, JANUARY 17, 1915
Captain Azan, resting at his command post, in military cloak and knitted helmet. He received his first wound in this same first-line trench on that very day

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ary 17, 1915, before Langemarck. The German "snipers" in the trench facing mine had a machine gun or a rifle on a support; they had been patiently firing for a long time at the same spot in the wretched parapet, made of bags of dirt and mud; they had pierced some of the bags, the contents of which had fallen on the outer side of the parapet. When I passed that point, at 3 P.M., while making a tour of inspection of the trench, I was hit by a bullet in the arm, most unexpectedly, for I thought myself protected by the parapet. Several men on our Front were killed or wounded by this means.

All the men should know how to observe and to watch; and each one of them should give his chief the advantage of such information as he may gather. But certain ones are especially adapted to this rôle and are selected to perform it. They are stationed in lookouts' posts in the first-line trench, or in listening-posts established in front of that trench. Some have to watch a very limited sector and observe anything of interest that may take place there: these are the sector watchers. Others have to watch points that are of special importance either because of their tactical situation or because of their insecurity in case of attack; in the latter case they are armed with rifles with reflectors or with rapid-firing rifles: these are watchers for

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special points. Lastly, special lookouts are stationed near the shelters, to give the alarm in case of attack or of a gas-discharge, or to repeat signals.

In the first months of the campaign the watchers supported by marksmen assisted materially in inflicting losses on both sides. I could cite numerous instances, showing how I lost men as a result of the patient watchfulness of our adversaries, and how, on the other hand, I inflicted losses on them. I remember, for example, the death of Private Paul Brochard, who, on December 15, 1914, in my trenches on the Strombeck (Belgium) was jumping up and down to warm his feet, unconscious that at every jump his képi went just above the parapet. He fell without a word into the arms of his twin brother Pierre, whom I had placed in his squad. On the 16th, during the night, a famous watchman-marksman, Private Éneau, orderly to Sub-Lieutenant Bertrand, observed that the enemy's loopholes lighted up one after another: it was an inspection by an officer who carried an electric pocket-lamp. When the light shone through one especial loophole, thirty or forty metres from us, at which his weapon was carefully aimed, he fired: a shriek of pain rent the air, followed by prolonged groans and an uproar in the German trench. The shot had gone home! Brochard was avenged.



WATCHER AND SNIPER (PRIVATE ENEAU WITH THE GLASS) IN A TRENCH
NEAR THE YSER IN DECEMBER, 1914



A SNIPER WAITING FOR A CHANCE, YSER, DECEMBER, 1914
In the trench, a shelter for a squad

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All the men should be fit to act as patrols. Save in exceptional cases, in sheltered or broken country, patrols go their rounds by night. The units in the line are notified of their hour of starting, the route, and the probable hour of their return, to avoid accidents or mistakes.

There are men endowed with special qualifications for this work. In my battalion of the 69th I had some genuine specialists, who performed many a prodigy. The whole battalion was notified exactly when the patrols would leap over the parapet; but the riflemen continued their fire, aiming into the air, in order not to arouse the enemy's suspicion by their silence; then we all awaited with considerable anxiety our comrades' return. Gallant, heroic Sergeant Montalbetti performed to the letter every time, with incredible audacity, the duties that I entrusted to him, always bringing his patrol in with full ranks; the men followed him with blind confidence.

The sending out of patrols should have a useful end in view. "To accustom the men to fighting," or "to make a show of activity," is not in itself an adequate motive. Such a method of handling affairs leads to dangerous excitement or to fruitless losses.

The commander's duty is constantly to safeguard his men's lives. To that end he issues

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“general orders” in the trenches, the result of the daily observations. These orders are either permanent, and form part of the budget of information which is in the hands of every commander of a trench, as a centre of resistance or of a sector; or they are temporary, in which case they are delivered to the watchers, sentries, and men on fatigue duty. Their careful observance may avert many misunderstandings and save many lives. How often have I seen, as the result of neglecting these orders, staff officers fall when sent out for information, or officers coming from the rear to take command of a unit, or impetuous young lieutenants coming from reserve dépôts, or artillerymen sent forward for observation, or absent-minded or boastful privates!

I recall Colonel Devaux, Chief of Staff of the Twentieth Corps, going out at nightfall, on November 28, 1914, to inspect the Langemarck trenches, with Captain de Suzannet. As General Balfourier, in my presence, urged him, above all things, to be careful, Devaux said to me, shaking my hand, “There are officers who overdo the precautionary business and sometimes doze a bit; I propose to see about that.” Four hours later he fell, mortally wounded. On January 6, 1915, Private Feitknecht was killed at my side, by a bullet in his head, just as I had called his attention to a slight caving-in of the parapet which

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enabled the Germans to see him if he did not stoop low enough. And so many others —

One of the permanent orders is not to let one's self be seen, and, above all, not to disclose the location of important points, such as observing-stations, observation posts, and command posts. In February, 1917, I was a witness of a deplorable piece of carelessness, at an observation post in the front line, at the "Poteau d'Ailles" facing the Chemin des Dames. I was at that post, with Captain Martin, when a group of subalterns, belonging to a colonial regiment then occupying that sector, walked all about us. When I called their attention to their carelessness, they replied that they were perfectly familiar with the place and did not think that they were guilty of imprudence. Only a few moments later, Captain Martin and I were followed along the boyau we were passing through, by well-aimed salvos of artillery. And the next day two officers and a subaltern, stationed in that same observation post, were suddenly caught by a violent discharge of artillery and killed.

Silence is one of the essential rules of the trenches. It should become an invariable habit with the men, because of the advantages it insures: it leaves the enemy in ignorance as to the numbers in occupation of the trench; it enables the riflemen and watchers to perform their duties

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more efficiently and to hear the faintest sounds; it makes it possible for a commander to transmit an order from man to man without raising his voice; and in case of an alarm it makes easier the prompt stationing of each man at his post. This is one of the most essential qualities of a well-disciplined body of troops.

Silence is hard enough to obtain in a body in which it is not a fixed habit. Whenever I took command of a new unit, I always imposed silence when on duty, and I secured it. It even came about that the men spoke only in undertones while we were on the march and in the rest cantonments! Their gayety and enthusiasm were in no wise lessened thereby, while the maintenance of good order was greatly facilitated under many circumstances, especially in actual fighting.

The commanding officer should be careful to observe himself the orders given to his command. He has more obligations than anybody else. He seeks by every means to inspire confidence in his troops; to that end, he often shows himself among them, going to inspect them in their trenches. In planning the frequency of these visits, he takes into account the technical ability of his subordinates, the morale of his command, the mission which is entrusted to him, and all the other circumstances. He has not, however, the same obligation whether he commands a large unit or a

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small one, for it is not the duty of a general of division to go through some one of the innumerable trenches under his command each day. On the other hand, it is the duty of a battalion commander or of a captain to be perfectly familiar with all the trenches occupied by his troops. There is no hard-and-fast rule to be laid down, unless it be that a commanding officer should act according to his conscience and the necessities of the situation.

I recall the effect produced by a visit in broad daylight to my trenches at Passchendaele, when there was no boyau by which I could go there. I was not guilty of imprudence, for a dense mist made it impossible to see more than a few metres; but my officers and troops, whom I could inspect only at night, manifested great delight because I had come to see the works at the first opportunity. Moreover, I was able that day to take account of many details which had escaped me in the darkness.

Only the frequent presence of the commander will enable him to ascertain whether his orders are carried out. When a command knows that an officer will check up its work, that he will approve or censure, it works hard, as a matter of affection no less than of self-respect.

I remember an anecdote apropos of this subject. It was on the night of March 31, 1915.

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I had ordered Captain B——, who commanded my reserve company, to dig in a hurry some transversal trenches, for the better protection of a glacis which separated my first-line trenches and support trenches, and which the Germans, in case of an offensive, must necessarily cross. Between half-past nine and a quarter to eleven I went with him and the platoon leaders to decide upon their location. The next night I found that the work was barely begun and was being carried on by a very small crew. I went to the captain's command post, and he detailed all the difficulties he had encountered, especially the enemy fusillade which made the work extremely dangerous. I made no comment, unless by the coldness of my manner, and told him to get his platoon leaders together. Then I went over the terrain with him, Sub-Lieutenant P——, and some subalterns, walking with calculated deliberation, marking the lines of the trenches to be dug and distributing the work. The bullets have rarely been so numerous as they were that night, and one of the subalterns saw fit to call my attention to the fact. I replied in my most phlegmatic tone, "It's much to be regretted." However, by a happy chance, not one of our party was hit. But B—— understood the lesson and never again compelled me to repeat an order; indeed, he fell gloriously two months later.

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The inspection of the trenches and checking-up of the work, which are necessary even with a picked body of men, have another advantage than that of insuring the faithful carrying-out of orders. They enable the commander to give his orders with full knowledge of conditions. The chief who has seen the terrain with his own eyes can express his wishes in terms of absolute precision and certainty; and, above all, he gives only orders that can be executed.

One of my generals of the Twentieth Corps, General Chrétien, may be cited on this subject. On January 18, 1915, he came to the trench north-east of Langemarck occupied by my company of the 153d. To get there he had to follow in the darkness a route where in places one sank in up to the knee; where immense shell holes were spanned by slippery, unsteady pieces of timber, where there were ditches two metres broad, filled with water, and miry tracts swept by missiles.

He finally arrived at my command post, located against the parapet. It was a wretched shanty, with a roof of tarred paper stretched over stakes; and the earth floor was under water. I shared it with my orderly and four *agents de liaison*! Only by stooping down could one get into it, and when it rained, the tarred paper burst, letting the water from the sky through the holes, to join the

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water on the ground. The general entered and crouched there a moment to talk with me; then he walked along the parapet of mud and bags of dirt, which my men were constantly rebuilding and behind which one could not walk except bent double. He had a chance to see the shelters of my men, also situated against the parapet by force of circumstances, and even more wretched than mine. He got a glimpse of the works we had improvised against the water: holes and canals and ditches — which I pointed out to him so that he might avoid them. He talked with the soldiers and could appreciate their cheerful humor and spirit of discipline amid so many hardships. Then he went away, carrying with him a vivid picture of all he had seen that night. We could always discern in his orders his knowledge of actual conditions.

A commanding officer who visits his trenches learns to esteem and love his troops; furthermore, he makes himself known to them, he wins their confidence. Later, when he has to intervene at a critical time, his ascendancy is already established, his authority is increased threefold.

. . .

Liaison is the most important among the duties of the troops in the trenches. In present-day warfare, this word does not mean simply all the

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methods of effecting communication between different units of the same arm, or between different arms. It includes both the methods of collecting information and the methods of transmitting it.

The abundance and accuracy of information are, indeed, among the most important factors of every action, offensive or defensive. It would serve no purpose to have safe means of communication, if they were not used for transmitting reliable and useful information. In a word, information takes precedence over transmission.

Methods of obtaining information are studied and provided for by officers of every rank in the zones assigned to them. They are set forth in a "plan of observation."

The observing-stations may be on the ground or in the air.

Those on the ground have the advantage of working in all weathers and of being hidden from the view of the enemy. They should be carefully camouflaged, and supplied with shelters to which the occupants can retire in case of danger. The paths leading to them are closed to visitors and sight-seers, so that they may not be detected by the enemy; only the officers and men on duty are allowed to go there, as well as staff officers and officers of artillery, a part of whose duty it is to pass some time in these observing-stations.

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Often the precautions are slackened just when reliefs are taking place. For instance, I recall that, in February, 1917, when the Twentieth Corps had taken over a sector opposite the Chemin des Dames, the troops who were leaving the sector had left no officer, no private, no paper, in certain very important observing-stations. The artillery officers arrived to make their reconnaissance. I met several of them wandering through the boyaux, and even outside of them, searching, as I was, for the observatories; some of them went where they could be seen from the German positions. In a few minutes a German aeroplane flew over the spot where we were; and, despite the fire of several of our batteries, was able to get a perfect idea of the points about which our reconnaissance was going on. The Germans were careful not to fire: they had the information they desired, and reserved the destruction of the observing-stations in question for the day when it would be of service to them — that is to say, the day when we should begin an attack.

The aerial observing-stations have the advantage of being able to change their position according to the information to be obtained: they are balloons and airplanes; their disadvantage is that they cannot work in all weathers. They can secure information of the most minute precision and accuracy, thanks to photography, and

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can follow the works of the enemy from day to day. But the reading of photographs is decidedly difficult unless one is prepared for it by special training. Then, too, it is necessary to take into account the camouflage by which the enemy may have concealed his actual works, and the false trenches, false gun emplacements, and false earthworks which he may have marked out on the ground to lead us astray.

The *agents de liaison* are human instruments of information for the High Command. While in small units they are confined almost entirely to the rôle of instruments of transmission, bearers of orders or information, on the other hand, in large units and in the artillery they are instruments of information. They are officers sent by the generals commanding large units to the lesser units, with instructions to keep them posted as to what is taking place. They are artillery officers or subalterns sent to infantry units, with the mission of keeping the infantry commander, on the one hand, and the batteries of artillery, on the other, fully informed at every moment. Thus their presence permits the liaison to work smoothly.

Transmission comprises all the methods which make it possible to establish swift and sure communications between different troops.

One method dominates all others — that is, the

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moral liaison, secured by a perfect knowledge of the mission assigned to the troops, and of the commander's intentions. If the fighting men in all ranks know the end to be attained, they run less risk of making mistakes; and if all the means of communication should be destroyed, they will know what to do.

The instruments of transmission are numerous. Those most used are the telephone, the telegraph with or without wire, runners, signallers, rockets, Bengal fires, pigeons, dogs, motor cycles, automobiles.¹ They are employed according to the circumstances and the terrain; consequently, they have to supplement and replace each other, and are all constantly in use. Three of them are used more generally than the others — the telephone, wireless telegraphy, and couriers. The telephone makes possible the establishment of complete systems of communication, as well between the commanding officer and the troops under his command, as between the artillery officers, their observatories, and the infantry whom they support. Wireless telegraphy permits communications of all sorts, but especially between aircraft and the ground. Runners are, in certain critical cases, the only means that can be employed.

These various methods of transmission make

¹ See *The War of Positions*, under "Liaison," pp. 54-60.

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it possible to insure the communications laterally as well as from front to rear. They do not operate, however, without the personal, individual fearlessness of those who make use of them. I could tell many a tale showing the devotion to duty of the telephone crews going out to repair their lines under fire; the coolness of the aviators transmitting, amid enemy anti-aircraft fire, the information essential to the High Command or to the artillery; the heroism of infantrymen who came forward to offer to carry messages that might help to win a victory, over a terrain swept by machine guns and artillery.

The liaison service must be included in the plan of organization of a position, and must be made certain for all ranks.

In each unit larger than a regiment a staff officer looks after the liaisons.

In each regiment it is looked after by an officer, generally the officer in charge of the telephone service. There is also a regimental officer in charge of the information service; he must be active and intelligent, must seek information instead of awaiting it.

The colonel of a regiment should always issue a daily bulletin at his headquarters containing the information sent down to him from his superior and that which he collects from his subordinates. This bulletin forms a useful

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source, not only of information, but also of diversion for his officers and troops. The men in the trenches are out of the world to a degree that one can hardly imagine. They have little news from the rear or from other portions of the Front. Newspapers arrive seldom, with great difficulty, and in only a small number of copies; they are already old, and they soon become mere rags and tatters with water, mud, and dirt. Books are an encumbrance which very few men think of taking with them, their burden of indispensable articles is so heavy; and in truth they could not be read attentively or connectedly. Letters are the most precious mental and sentimental sustenance. They are brought to the battalion commander's station by the sergeant in charge of the post-office. From there they are distributed among the *agents de liaison* of the companies, who carry them to the captains. They give each man news of his family and of the friends who are fighting at other parts of the Front; they also bring news of those charming persons, known or unknown, who are called "godmothers."

There are two varieties of godmother: those who try to afford the soldier greater physical comfort, and those who lavish sentimental attentions upon him. The former send sweaters, drawers, jams, cigarettes — everything capable of ameliorating the well-being of the soldier: they



THE GREAT SQUARE AT YPRES IN APRIL, 1915

Chevaux-de-frise carried by British soldiers. In the foreground, the mechanism of the great clock in the tower of Ypres, which has fallen into the square



ARRIVAL OF THE SERGEANT IN CHARGE OF THE POST OFFICE, AT THE
COMMAND POST OF MAJOR AZAN AT GRAVENSTAFEL IN APRIL, 1915

Distribution of letters to the *agents de liaison* of the companies

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are true benefactresses. The latter write letters in which pretty fancies flutter among the lines, with the hope of a meeting during the next furlough; if one of them sends a sweater it is because it will be worn, in preference to any other, by him who, amid shells and rifle-balls, often sends forth his loyal thoughts in her direction. They, too, are benefactresses; for the Frenchman is always in need of a little blue flower to embellish the garden of his heart. He who has neither wife nor fiancée finds himself very lonely in the trenches. While his comrades receive letters which they read with ardor and emotion, he is conscious of no sentimental agitation on reading his serious epistles. So his godmother gives him a share in the happiness which he lacked. Even when the imagination plays the chief part in these epistolary adventures, a momentary diversion is the result. Such was the case with that infantryman who, after three months of an enchanting correspondence, went to call on his godmother on his first visit to Paris, and found — an old grey-bearded man! But his heart had been deeply stirred for three months; moreover, he had an excellent dinner with the old gentleman. Then he set out in search of another godmother.

. . .

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The supplying of the trenches with sentiment and even with such material articles as may be furnished by these "war godmothers," is only a pleasant but not indispensable supplement to the general provisioning in food-supplies, munitions, and matériel, which is planned and organized by the High Command.

Provisioning in food-supplies is operated from the interior zone to the Front by successive distributions and reforwardings. The daily supply trains carry the supplies for the large units to the railway distribution stations. There, the commissary-general of each large unit takes possession of them and transports them to a provisioning centre in the vans of his train. At this centre the commissary department distributes them to the supply officers of the regiments, who have them loaded on the regimental vans and despatched to the companies. When the regiment is near the distributing station the commissariat naturally delivers the supplies on the spot to the supply officer. In the regiments the captains receive funds for the purchase of additional supplies, either from the near-by district or through the commissariat.

The food is prepared in the kitchens, which are set up in places as sheltered as possible from the sight and the fire of the enemy. Travelling kitchens are a special type of vehicle which per-

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mit of the preparation of food and transporting it hot to the point where it is to be distributed among the platoons and squads. But from that point, too, it is necessary to use mechanical methods of transport as much as possible, not only to spare the carriers, but also to make sure that the food shall be hot on reaching its destination.

The cooks are modest heroes, whose conduct, especially in the first year of the war, cannot be praised enough. I have seen instances of superb devotion to duty on the part of those men, who made it a point of honor that their comrades should have their food on the moment and in good condition. In Belgium, before Passchendaele, my cooks, installed in the ruins of Saint-Julien, travelled five kilometres on foot to the trenches over ground constantly under fire. Carrying incredible burdens (for I was niggardly with men for fatigue duty), they went bravely through the darkness, trying to avoid shell holes, old trenches, and ditches. They made this journey to and from the Front just before dawn and again at nightfall. In April, as the nights got too short to carry the food twice and do the twenty kilometres, they carried hot soup only once, before daybreak; we kept a cold meal for the day.

I do not understand why the cooks were not oftener killed or wounded; but they chose their

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route and their time with extraordinary skill. Frequently they were the oldest men in their company, and fathers of large families. They had, however, no protection in performing their functions. I remember one poor fellow who was hit near my command post, and whose greatest anxiety was to know how the food that he brought was to find its way to his comrades!

Bringing in supplies of munitions and matériel is a delicate operation because of the difficulty, augmented by the danger, of transport up to the first-line trenches. It is essential, as in the matter of food-supplies, to use, as far as possible, narrow roads and mules and donkeys, to decrease the number of men employed and to save them from fatigue.

One excellent method consists in always giving munitions or matériel to small units on their way to the Front, when not too heavily laden; they leave them at the dépôts, and the process goes on until the dépôts are sufficiently stocked to meet all possible demands. By the establishment of successive dépôts in the army corps, the division, the regiment, and the battalion, it is possible to arrange that no company shall be without matériel for its immediate needs; for sometimes it takes a very long time to bring up matériel from the rear. The dépôts are not set up, as some too forehanded superintendents sometimes

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imagine, to remain full when the units are in pressing need; they must be depleted in case of necessity, and be filled again as soon as possible. These operations should be conducted without bureaucratic red-tape, which exasperates the parties in need and confuses the deliveries.

Nevertheless the distribution of matériel to the units must be carefully supervised if we would avoid wastage and negligence. The commanders of units make known their needs daily, and they are supplied, completely if possible, or in proportion to the quantities requested and in conformity with the tactical situation. It is always advisable to give to the head of the party transporting the supplies, a concise list of the munitions and matériel of which he takes charge; he brings back a receipt signed by the officer to whom the supplies are given.

My first battalion dépôt was set up on my initiative, because I had found that my men, in order not to be burdened, when they were relieved, with the boxes of cartridges they had brought in, had a habit of firing them aimlessly or throwing them away. I ordered that, whenever we left the trenches, all the boxes of unused cartridges should be collected, and a memorandum of them handed to the relieving unit. And the same with the matériel: during the weeks when the demands were not very urgent, I installed,

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near my command post, a *dépôt* of the most useful things — wire, *chevaux-de-frise*, bags of dirt, pickets, gabions, hurdles, timbers, etc. This store was of great service to me after days of bombardment when my trenches had been pounded to pieces.

The provisioning in men is called "relief." This operation consists in replacing a unit occupying a limited zone by a fresh unit from the rear. It demands at every stage much consideration, system, and care.

There is no period definitely fixed for the stay of a unit in the trenches. We may assume that six or eight days in the first line are enough; but that length of time may be increased or shortened according to the condition of the men, which depends on the weather, the arrangement of the shelters, the activity of the enemy, and so forth.

The relief is generally preceded by a reconnaissance by the commander of the corps, the battalion commanders, the company commanders, and some inferior officers. It is executed, so far as possible, unit by unit, without change in the distribution of the troops. There will previously have been occasion to make allowances for the variations in effective strength, sometimes considerable, between units of the same order; these variations, in fact, lead to difficulties in regard to



A RELIEF MARCHING THROUGH A BOYAU



FRESH SUPPLY OF MUNITIONS AT THE MORT-HOMME NEAR VERDUN

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trench-guards, assignment of shelters, etc. The relief is handled by the officers of the units relieved, who know the lay of the land and the special orders. These officers are careful to transmit, with all needful explanations, the information concerning the zone they are leaving; they emphasize those orders which may save the newcomers from heavy losses; finally, a certain number of them stay on for a day with the relieving officers, to assist them with their experience and advice.

It is of essential importance that the occupants of a trench shall be properly acquainted with their surroundings. When one arrives at night, often after a fatiguing march through strange trenches, this is no easy matter.

I could tell many anecdotes on this subject. I will confine myself to one which is especially typical. During the night of December 15, 1914, with my company of the 153d I had relieved another company stationed just beyond the little stream called the Strombeck; on my left a narrow, swampy tract lay between me and Captain André Laffargue's company; on my right a much broader, inactive zone, through which the stream flowed, separated me from another company, in relation to which I was in a salient. As my trench was only 30 or 40 metres from the Germans, some observers of the company on my right, see-

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ing the trenches so near together in the same line, thought that they belonged to the same organization, and opened fire on my right platoon. I went myself to see what was going on: one man was dying, two others wounded; I myself, as well as Sub-Lieutenant Bertrand, came within an ace of being hit. Upon examining the parapet to find the projectiles that were coming into it, one of my sergeants extracted a bullet of the French pattern of 1886! There was no further doubt as to the source of the firing. Moreover, our batteries of seventy-fives, replying to what they took for a bombardment of Laffargue's company, sent a volley which was aimed short, and fragments of shell flew all about us! Communication with the rear was almost impossible by day, because one had to pass across a hillside on the other side of the stream that was completely swept by the German fire. Two brave fellows took their lives in their hands by signalling with their képis on the ends of their rifles. The infantry fire ceased; but it might begin again and I dared not reoccupy my trench. Two volunteers offered to go, one to the battalion commander, the other to the neighboring company. We followed their progress in an agony of apprehension. They reached their destinations and order was restored. But I did not fail to learn from that incident the lesson that it taught.

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The establishment and verification of all means of liaison is one of the first duties of the commanders of units.

How many accidents and mistakes would have been avoided if that rule had always been faithfully observed! I had many opportunities to realize it; but one of the most characteristic was the adventure that befell me on February 20, 1915. That night for the first time I and my battalion of the 69th went through the relief in the Paschendaele centre of resistance. A company of Territorial Infantry had been left there, framed in on each side by my companies, whom I had ordered to be careful to establish communications with it. When, on making the rounds of my line, I came to the Territorial company, it was impossible for me to find the platoon leaders: the men had no definite orders, no precise orientation! At the end of a half-caved-in trench which was lost in the water, no one could tell me where the next one began; so I went on with Lieutenant Dardaine and the *agents de liaison* I had brought with me, following as best I could the old inundated trench. But we suddenly discovered that we must be between the two lines; the trench had been moved back because of the water. On climbing out of it we ran the risk of being taken for German patrols; luckily the Territorials in that section were negligent in doing

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their duty and allowed us to get back into the lines by marching diagonally.

When I attempted to leave that company and return directly to my command post, I asked the captain for a guide. He replied that the "liaison man" who had been with me had just started for my post, and that nobody else knew the way. I had to find my road for myself, over the glacis swept by rifle-bullets and shells, consulting my compass under my cape, by the light of an electric pocket lamp, forced without reason to run the risk of an idiotic death! The officers who were guilty of these errors were fine fellows, no doubt, but spoiled by their inertia, their carelessness, their lack of initiative, or else badly trained because of the inefficiency of the leaders who had had them in charge.

I had other adventures of the same sort. So that I was led to prescribe the following exercise: every day at a certain hour, an order started from my command post through the right of my line; it was to come back to me by way of the left, bearing the signatures of all the captains and platoon leaders with a note of the time when it passed through their hands. This exercise, varied by divers combinations, enabled me to assure and to check up, from the time of my arrival in a sector, the liaisons both laterally and in depth.

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The men coming from their cantonments ought to arrive at the trenches in good condition. To this end they must be spared all unnecessary fatigue; for example, by bringing them in motors as near the Front as possible. Noise and lights and cigarettes should be forbidden, to avoid putting the enemy on the alert.

The relief is subject to a certain number of rules,¹ some of which vary with the different sectors. It must be effected with the most perfect order. The units relieved go away with the same precautions taken by those of the relieving force, in order not to reveal the operation.

The sojourn behind the Front, in camps, in barracks, or in villages, gives the officers a chance to get their troops in hand, to restore the cohesion and mobility which life in the trenches tends to diminish; and, above all else, to resume and perfect their instruction. It is the officers' duty to maintain strict discipline, while keeping up friendly and paternal relations with their men; for example, to insist upon the salute, which is the external sign of a well-trained force; to look to the cleanliness and neatness of clothes and weapons; to establish pleasant relations between the troops and the civil population; and to protect their men against dishonest tradesmen who sometimes try to cheat them.

¹ See *The War of Positions*, under "Relief," pp. 68-75.

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Taken as a whole, it is a special type of existence, too common to be described, which affords a well-earned relaxation between periods given over to danger and to suffering.

. . .

A complete description of trenches and trench life would include the whole geography of the Front, the whole history of the war.

Although trenches do not constitute an epitome of modern warfare in all its development, they do occupy a preponderating place in the life of the combatants. It is in them, indeed, that they pass weeks and months, waiting for the moment to cross the first-line parapet. There it is, in fulfilling the daily tasks imposed by the proximity of the enemy, or waiting for long hours in dark and ill-ventilated shelters, that the soldier makes the acquaintance of the comrades with whom he is one day to risk his life. From there he watches the departure of the wounded to the hospitals, there he fulfils the last sad offices for the dead.

Each trench is associated in the mind of whoever has lived there with innumerable memories. Tiny events in themselves, having none but local importance, for the horizon is limited by the trench itself, yet they are carved forever in the memory. How often in my dreams at night,

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or in the daytime, in the midst of a numerous and happy throng, do I see before my eyes the trenches of France!

The trenches of Belgium in 1914, deep in the mud that lines the Yser; the reliefs, when men filed through the swamps where no boyau could be dug; the parapets made in part of human bodies, above which the first defenders had heaped mud; the poor wounded who had to be removed at night, with bullets whistling on every side; the dead who were buried where they dropped, for lack of means of removal, and whose graves were marked by crosses of sticks. These were trenches of desolation, suffering, sadness, and death.

The trenches of Artois in 1915 in the chalky soil, opposite the famous Labyrinth, and Neuville Saint-Vast, trenches relatively comfortable, in which my men peacefully carved little chalk figures, before going to that combat where so many of them were to lose their lives.

The trenches of the Somme in 1916, the successive lines of which marked on the ravaged earth all the phases of a successful offensive carried on for months together; the improvised niches, in which the soldiers of the Twentieth Corps were installed opposite a German trench on the reverse slope, in a sunken road; the trenches of the Moulin de Fargny face to face

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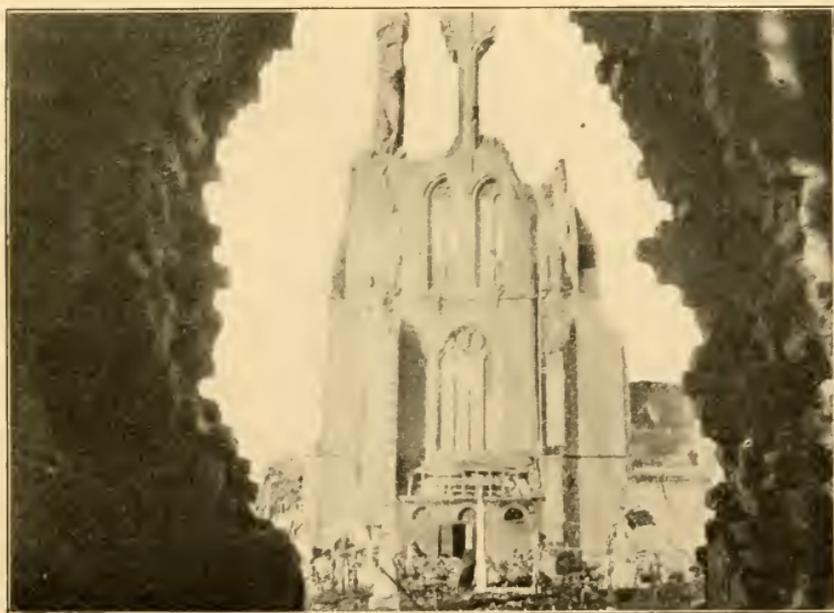
with the celebrated German position which we called "Le chapeau de gendarme."

The trenches of the Aisne in 1917, with the calm days of the beginning of the year, when we could see from a first-line observation post the German sappers digging new boyaux in the open, half a mile from us; where we could admire, from the commanders' observing-stations, the peaceful aspect of the "Chemin des Dames" and the enigmatical towers of the cathedral of Laon. Then the feverish activity of the preparation of the offensive, and the numerous tasks connected with the emplacement of batteries, the maintenance of roads, the organization of railways, and the creation of dépôts of all sorts, the whole silent and peaceful zone suddenly turned noisy and bustling.

In all of these regions there lie countless little wooden crosses, marking the spots where lie the dead. Sometimes they are scattered, as in Belgium, where they disappear, little by little, in the mud, together with bodies that were never buried: or on the Somme, where the slopes facing Maurepas or Combles were dotted with these humble monuments, often made of two sticks from the remains of some tree. Sometimes they are grouped in numerous cemeteries, as at Saint-Julien, and Saint-Jean, near Ypres, where I have seen so many of my friends laid to rest, or at



WELL-CARED-FOR GRAVE OF A FRENCH CUIRASSIER BETWEEN
BOESINGHE AND LANGEMARCK (1914)



RUINS OF THE CHURCH OF LANGEMARCK, DECEMBER 3, 1914
View taken from the house of Lawyer van der Meersch

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Maricourt, facing the Somme, where I had the greatest difficulty in finding the grave of one of my bravest comrades of the Sixty-ninth, Captain Bolle.

In Champagne there is a grave which I have never seen. A little cross bears the name of him who was my second father, of him who was for long years my loving guide, of him who died gloriously in the offensive of 1915. It is safely sheltered from the devastation of the Germans, and I know that it is kept in order by the pious care of the officers in that region.

But why should not the Government, and the village authorities, decide to preserve, alongside of the cemeteries, and isolated graves, the remains of these trenches, where soldiers of England, of Belgium, of Canada, of the United States, of Portugal, of Russia, and of France, have lived and suffered? The ground is convulsed by earth-slides, robbed of its trees by shells, ravaged by explosions, and little fit for cultivation or building for long years to come. They would be, in their tragic simplicity, precious monuments for the generations yet to be. Built with a little of the earth of France and the blood of so many brave men, they would perpetuate the memory of the heroic years, when the men of all civilized nations triumphed over the barbarian hordes. They would constitute a

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sanctuary where our little children would come, like pious pilgrims, to render homage to those who, in our noble and serious age, have suffered, grown old, and fought for years, and to those also who gave their lives freely for the cause of Liberty.

IV

PREPARATION OF AN ATTACK

LECTURE OF NOVEMBER 5, 1917

SUMMARY

The attack in the present war. — The four phases of offensive combat in the war of positions. — Two of these phases, the pursuit and the march of approach, will be described theoretically, as they have not yet taken place.

The preparation of the attack is a long process. — The plan of action. — The four parts of the preparation.

Detailed study of the two opposing positions. — Position of departure: battle maps; reconnaissances. — Position to be attacked: information by aviation, artillery, infantry; battle maps; study by personal observation.

Material aménagement of the departure position. — Plan of aménagement. — Rôle of the engineers. — Line of departure. — Works for the artillery. — Ways of approach: railroads, roads, narrow-gauge roads, boyaux.

Smashing the enemy's position. — Plan of action of the artillery. — Aerial and ground observation. — Artillery preparation. — Recollections of a period of preparation (April-May, 1915). — Failure, with appalling loss of life, of attacks executed without sufficient preparation.

The physical, professional, and moral training of the troops. — Physical training: sports, drink, food. — Professional training: instruction camps for large units. — Moral preparation: religious, patriotic, and humanitarian ideals. — Influence of the commander before the attack. — Development of confidence in the troops.

An attack well prepared must succeed.

It is never a wise move in modern warfare to make an isolated attack, for the enemy is always able in such case to mass his reserves behind the threatened zone. Moreover, an attack should

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not be carried out on too narrow a front. Such an attack can, at best, achieve merely a local success, the value of which is out of proportion to the loss of men, the wastage of matériel, and the expenditure of ammunition.

Every attack should be accompanied by one or more others, carried out at different points, and launched, if not simultaneously, at least within a few days of one another. The object of an attack is to gain possession of a position, or of several positions in lateral contact, and the corresponding positions echeloned behind. The capture of these positions has the effect of breaking the enemy's front; his army may be struck through the breach and disorganized.

In order to study an attack as a whole, it is needful to consider only so much of it as affects a single position; the combat in the adjacent regions is developed in similar fashion.

There are always four successive phases in a modern combat, namely: —

- (1) The preparation of the attack.
- (2) The attack itself.
- (3) The pursuit beyond the position.
- (4) The march of approach toward the next position.

These phases reappear in one unending cycle, as long as there remain unconquered positions, echeloned in depth. The combat may, however,

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begin with any one of the four. For instance, if there is a surprise, without preparation, the first phase may be the attack, the second the pursuit; if contact has been lost, the first phase will be the march of approach, the second the attack. Once the combat is joined, the phases succeed one another in the order named.

One or more of the phases may be but slightly developed. If the positions echeloned in depth are very close to one another, the pursuit may be limited to a few hundred yards or less, and the same is true of the march of approach. It should, however, be accepted as a matter of principle, that all the phases are present in one form or another; the failure to recognize this has involved the Allied armies in frequent mistakes.

The commonest error, and the most disastrous, the error which still lingers in the minds of many persons, consists in believing that after one or two positions have been captured, there will be no more behind. Were that the case, had the enemy prepared and occupied no other positions, he would be powerless or demoralized, and the victory would already be within reach.

These are principles which are fundamental in the theory of the war of to-day, to which I have given the name "War of Positions."

. . .

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An attack must be prepared according to a methodical scheme, often taking weeks or months before all is ready.

The preparation is, in part, the work of the troops who, in turn, occupy the departure position; it is also, in many respects, dependent upon the intentions of the commander, when he decides upon executing the attack. These intentions are explained in a document called the "plan of action" which sets forth the limits of the zones of attack, the duties of the various troops, and the successive objectives to be attained.

The commander of the attacking army and his staff begin by making reconnaissance. The commander then draws up his plan of action, which comprises: a definite disposition of all the available divisions, and the assignment of the duties and objectives of each; the location of the reserves, and their eventual duties; the artillery plan of action, drawn up in consultation with the artillery commander; the duties of the engineers; the distribution of the air service; the orders for operations in the rear, including those for supply and evacuation; the arrangements for reliefs, or for manœuvres which may become needful during the course of the combat; the specification of the troops who are to constitute these reliefs or manœuvres.

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It is a fact that manœuvring enters more into modern warfare than some persons imagine. Usually a nest of resistance which halts the advancing troops is conquered by outflanking, and not by a repetition of sanguinary and profitless direct assaults. For this reason, in preparing an attack, it is better to put relatively few troops in reserve before the obstacles which are believed to be difficult of conquest, and to have many troops echeloned in depth before those zones where progress will be easy.

When the army commander has drawn up his plan of action, he communicates it to each of his subordinates. Thereupon the officers of the different grades in the hierarchy draw up their plans also. It is necessary that the duties of each unit should be sharply defined and its objectives clearly indicated. Even if there be an objective beyond which the troops should not go, it is well to make some plans for the succeeding attack, lest excessive prudence prevent reaping the entire fruits of success.

The preparation of an attack is generally long and minute if the enemy has been long in his present position, for he will have had time and opportunity to fortify it at every point. On the contrary, the preparation may be reduced to a minimum if the enemy has been in place for a short time only, in order not to leave him the

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leisure to construct strong defences. The commander decides whether or not to attack hurriedly, according to the information which he receives.

The preparation of an attack includes, in principle, four parts which may be carried on simultaneously: —

(1) The detailed study of the two opposed positions.

(2) The material preparation of the departure position.

(3) The complete shattering of the position to be attacked.

(4) The physical and moral training of the attacking troops.

. . .

The detailed study of the two opposed positions is a work calling for method, patience, and conscientiousness.

As far as the departure position is concerned, the task is relatively easy; it is merely needful to prepare accurate maps. These maps are called "battle maps" (*plans directeurs*). At the beginning of the present war this title was reserved for the "firing maps" (*plans directeurs du tir*), used for regulating and adjusting the fire of the heavy guns. To-day the simplified title applies to the maps for directing operations. These maps

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are made by a special service, called "fire sketch groups" (*groupes de canevas de tir*), which is included in each army, and represented by topographical sections in each army corps. A central service, called the "geographical service of the army," resident at Paris, has the duty of reproducing all the battle maps and plans made by the fire sketch groups. The standard scales for these reproductions are 1:20,000, 1:10,000, and 1:5,000; the officers of the American army should become familiar with these maps. The battle maps which give the French trenches are usually drawn to the scale of 1:10,000; they are secret, and distributed in limited numbers, since their capture would convey valuable information to the enemy. The Command must see to it that these maps are always kept up to date, for new works are continually being made, especially in periods of preparation.

It is essential that officers should not only study the battle maps, but should also reconnoitre in person the trenches which are under their authority. It is the only way to make sure that work is properly carried out, that what is foreseen is in accordance with actual needs, and to discover what further work may be necessary. This is essential also in order that an officer shall be able, at the moment of attack, to give his orders with certainty and to direct his troops with

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effect. To this end the officers should furthermore study, on the ground, the sectors next to those occupied by their own men; this sort of reconnaissance is useful, both for maintaining liaison and for possible lateral displacements.

I have had many occasions to verify these principles; I have also continually called them to the attention of my subordinates.

In the course of the period which preceded our attack of May 9, 1915, against the "Labyrinth," we occupied for several days trenches near the village of Écurie, whence we were to start for the assault. I gave written orders to my company commanders to send their N.C.O.'s and privates, during rest hours, in small groups, to reconnoitre the trenches, the command posts, and the boyaux of the adjacent units. In spite of this precaution, we had a misadventure the day of the attack.

The fifth company, with which I was marching, had as its departure station a trench which it had occupied during a previous stay. To get there it had to pass through boyaux which spread out toward the Seventeenth Army Corps, placed on our right, and toward the Twenty-sixth Infantry, scheduled to start before us. At a fork the guides led the troops in the wrong direction. I at once saw the mistake, and gave orders to halt. An intense bombardment was scattering shell fragments and earth in every direction,



Two staff officers (on the right, Captain de Suzannet) coming to Cote 107, near Écurie April 27, 1915, at the command post of Major Azan, to inspect his trenches



The ruins of the Écurie Château, in April, 1915, near the departure trenches
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the wounded of the Seventeenth Corps were looking for a road to the first-aid station, and their unwounded comrades seemed uneasy. Fortunately I had been through these boyaux a hundred times, and they were all familiar to me. I hastened to the front of the company and turned them in the right direction. I did not fail to point out sarcastically to the officers and N.C.O.'s that my orders for interior reconnaissance, which had surprised and amused them, had been fully justified by the event.

On this very same day, May 9, another episode went to confirm the necessity for preliminary reconnaissance. The first two waves of the Twenty-sixth Infantry, which were assaulting the Labyrinth in front, had been decimated by rifle and machine-gun fire, the third wave could not even debouch from the sap. My battalion was the fourth, having as its objective "The Lindens." I wrote a note to my colonel in my report No. 5 of 3.10 P.M.: "I shall probably be obliged to file far over to my left, since all the saps from A14 to A5 are enfiladed by machine guns. Either these machine guns must be destroyed by artillery, or they must be taken in the rear by following in the footsteps of the Seventy-ninth, and afterwards bearing back to the right." I then made the preparatory manoeuvre of drawing my battalion to the left.

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At 3.40 P.M. I received word from my brigade commander to carry out the manœuvre I had planned. It happened that during my occupation of these trenches with six companies of my regiment, I had placed two companies of another battalion, the Eleventh and Twelfth, at the left of my line, so that the officers and N.C.O.'s of the companies I then had were not familiar with the spot. But I myself had often in person examined the liaison with the brigade on my left and passed through its trenches and boyaux; I was able to guide my battalion, and bring them to the German trenches without losing a man. Hesitation or delay in the boyau would have produced a deplorable effect.

The study of the position to be attacked is of the first importance. It is carried out by all arms simultaneously: aviation, artillery, and infantry; even the Command takes a hand.

In a work of this sort all the different means must be used so as to supplement one another. The scouting and observation planes take photographs which are studied in order to discover true or sham trenches, the emplacement of batteries, new works, and the progress of the work of destruction by the artillery. Captive balloons discover important facts. Artillery observing stations on the ground, usually used for finding objectives, as well as the stations for artillery

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adjustment, note significant signs. The posts for detection by sound or flash determine the situation of the enemy's batteries. The infantry observation posts, the reconnaissances and patrols, are means of more immediate observation; sometimes, in fact, a reconnaissance will have the effect of drawing the fire of an unsuspected machine gun, a patrol may capture prisoners, or pick up deserters who can furnish valuable information. Even the observing stations for the Command, following a methodical scheme of observation, can discover noteworthy facts. All the information obtained in these various ways is collated at the staff headquarters of each army, and subjected to a comparative examination.

The information obtained is put down upon battle maps, similar to those which represent the French trenches. The scales of these are usually 1:20,000, 1:10,000, or 1:5,000. The first-named are especially used by the Command and the artillery, for they give a general view of the hostile positions; the 1:10,000 maps are also used by the staff and the artillery; both are distributed as far down in the scale as to battalion and battery commanders. The 1:5,000 maps represent either the whole or a part of the enemy's first position, and are useful in arranging the infantry units in attack formation; they are

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distributed as far down as platoon leaders. They contain no details as to the French positions, lest they fall into the hands of the enemy.

In view of the possibility that the attack might be followed by a pursuit through a long distance, there are some maps drawn to the scale 1:50,000 showing the topography of the positions beyond those which are attacked.

The battle maps indicate all of the obstacles which will have to be overcome. Beyond this, the staff announces in a daily bulletin all information that has been collected concerning the enemy. The reason for this publicity is that a body of troops is much less discouraged by difficulties which are foreseen than by unexpected obstacles.

The study of the enemy's position must be made by the officers and N.C.O.'s, not only on the battle maps, but by personal observation. Generals and staff officers should frequently visit their observing stations, observation posts, and trenches; similarly, the commanders of units should be frequent visitors at the observation posts and trench watchers' posts, in order to fix the terrain clearly in their minds and to familiarize themselves with landmarks. Then, when the attack takes place, they will have less difficulty in realizing where they are, and will find their way about without consulting the map.

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This study of the positions should be carried out constantly during the period of stationary fighting; it is likewise necessary, before an attack, to give the troops a few days in the trenches in order that they may feel at home. This gives them the same advantage that a man has who is hunting or fighting in a country where he knows every road and every feature.

When the Twentieth Corps was sent from Belgium into Artois to take part in the attack of May, 1915, the officers received, a few days before the attack, some remarkably accurate 1:5,000 maps covering the enemy's position, sufficient in number so that all could consult them. Moreover, the different battalions were instructed to occupy, turn and turn about, the trenches from which they were to start for the attack. Finally, special reconnaissances were carried out by officers under the direct control of the generals, in order to establish contact between the infantry battalion commanders and the artillery majors, and to facilitate an examination of the German trenches and the eventual objectives in all of their different aspects. All these measures had the most excellent effect upon the course of events.

One omission, not chargeable to the account of the Command, unfortunately diminished the amount of this effect. The printed maps con-

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tained no hints as to the enemy's means of defence, such as blockhouses, batteries, or machine guns; furthermore, the emplacements for these, being variable, can readily be carted about in each sector in accordance with fresh information. The troops whom we relieved, and who had been there for long months, left us no information on this score; at least, I myself, though in command of six companies stationed in front of the Labyrinth, could obtain none. I was unable, in spite of the devotion of my men, to acquire all the requisite information in a few days; I could put down on my map only a few machine-gun emplacements, at a time when the Labyrinth was honeycombed with them. Had their presence in such numbers been known, it is probable that our artillery preparation would have been carried out more completely, and the Twenty-sixth would not have been so cruelly decimated.

The study which I had made of the position at least enabled me, when I executed a rear attack upon the Labyrinth, to give my orders and draw up my reports calmly and confidently, in spite of the whistling of bullets and the exploding of shells, always somewhat disconcerting. When I was wounded, May 10, alongside of Captain Lafontaine and Lieutenant Denoyelle, I wrote an incomplete report in my notebook. I

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had no need to look at the terrain or even to consult my map. In fact, it would not always have been easy to unfold this map. I had been obliged to do so only once or twice that day to make sure of my location, the axis of my advance, and my successive objectives.

. . .

The material aménagement of the departure position is intended to facilitate the initial task of the attacking troops and the continuation of the combat until the next position is conquered. It should be undertaken at the beginning of the period of stationary fighting, even before any orders for the attack have been given. There are three reasons for this: —

(1) When the attack is once decided on, a good part of the preparation will have been completed; this saves time.

(2) If the same sort of work is in progress all along the Front, the enemy will find it hard to determine, by any means at his disposal, just where the attack will be launched.

(3) Most of the work carried out in preparation for an attack is also useful for defence.

The aménagement of the position is not merely a question of organizing the line of departure, or even the first trenches. It involves an organization extending a long distance in

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depth and includes: the installation of artillery with spare emplacements; the preparation of observing stations, and battery emplacements for advancing the artillery; the establishment of new means of liaison, and improvement of those already in existence; the arrangement of systems of liaison to be run before the first line; and the improvement and increase of the roads and other facilities, either for bringing up reserves or supplies, or for evacuating matériel, wounded, or prisoners.

The plan of aménagement is drawn up by the commander of the position. It coördinates the various tasks and allots them an order of urgency. It fixes the date at which the various works should be finished, not overlooking the fact of experience that a house is never completed nor an exposition opened on the day set. A certain number of available days are always left between the presumed date for the completion of the work and that for the opening of the attack.

The engineer corps is especially charged with the execution of work of this sort. At the same time the smallness of their numbers prohibits their undertaking anything but the general control and surveillance, except in the case of certain very technical tasks which they alone can execute. The Command details working units

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from the troops in rest camp or from the territorial troops composed of older men. The relations between the commanders of these troops and the engineer officers or N.C.O.'s must be defined with precision. The officers in charge of the units should retain effective control over their men, and possess the sole authority to regulate their movements or delimit their duties; on the technical side they should, of course, always have the advice of engineer officers and N.C.O.'s.

The line of departure for the assault should never be more than three or four hundred yards from the enemy's first trench; it is well placed when the distance is two hundred yards. This is, in fact, a sufficient distance for the artillery preparation to be carried out without danger to the attackers and for a barrage to be placed between the two adversaries. The line is achieved by covered saps which enable advanced ground to be gained without attracting the enemy's attention. It is straight, without traverses, and so directed as to place the attacking troops, not parallel to the enemy's first trench, but face to face with the objective toward which they must march; this avoids changes in the direction of the march, always difficult to effect.

It is often advantageous, in order not to put the enemy on guard, to start an attack from

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the trenches themselves. In this case steps or ladders must be prepared for climbing out; if the troops start from several successive trenches at once, light footbridges must be thrown at the proper moment over those trenches which have to be crossed.

The tasks for the artillery are very considerable, for it is their duty: to install a considerable number of batteries, echeloned in depth, preparing spare emplacements, and erecting observing stations; to establish lines of communication between the batteries and the observing stations; to construct false batteries; to create shelters for munitions; to install supply routes and means for visual or telephonic communication; and to prepare the necessary roads for the forward movement, with new emplacements and observing stations.

The great number of tasks that are necessarily involved by the artillery offer no excuse for undertaking others which are useless. To be sure, all batteries at a sufficient distance from the enemy should be protected by camouflage; yet I have seen shelters requiring tons of wood and huge earthworks constructed for batteries which were never the target for serious fire by the enemy. It was all a waste of time and energy.

The munition dépôts should be so situated that the bringing-up, unloading, and distributing

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of ammunition is easily carried out. They must be large enough not to be congested and so that an aerial bombardment or a fire shall not produce a general disaster.

The means of access from the rear are of various sorts: —

There are the railways which serve to establish connection, both with the rear and with other parts of the Front. No section of them should be exposed to the enemy's fire for fear that transportation might be interrupted at a critical moment; when threatened with this, it is easy to construct a section of line beyond the zone of fire. It is frequently necessary to double or triple existing lines and to create spurs running toward the Front.

The roads must be kept in good order, so that motor convoys may pass at all times. This maintenance demands, in the periods preceding an attack, an amount of effort which is hard to imagine. On the Aisne, at the time of the preparation for the attack of March, 1917, the roads were cut to pieces with great rapidity, owing to the alternations of frost and thaw; at times it was necessary to stop all traffic in order to repair them. This work was so important that whole regiments were assigned to do it in each sector.

The proper operation of the railways and roads

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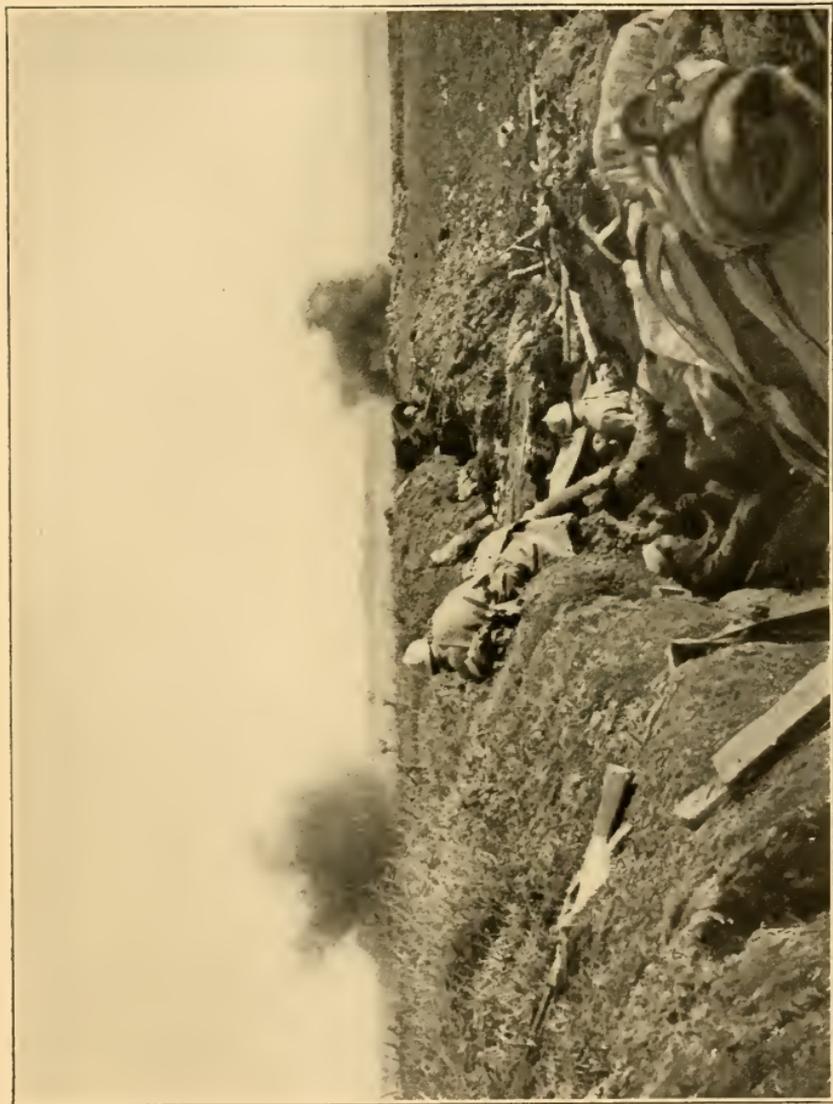
has considerable importance; on this depends the rapid arrival of troops at the desired points, and, hence, the possibility of surprise; the supply of the troops and the arrival of reserves during the combat also depend on this.

Toward the Front there are installed a large number of narrow-gauge railways, used to transport munitions and matériel of all sorts. Transversal trenches are made in as large numbers as may be necessary. Care should be taken to construct evacuation boyaux through which wounded and prisoners may pass without obstructing the boyaux by means of which troops and supplies are brought forward.

The plan of aménagement defines positions for dépôts to contain munitions, water, food, and grenades, and arranges for the construction of shelters, *places d'armes*, command posts, and observation posts, sufficient for all purposes. It indicates localities suitable for the passage of artillery, of cavalry, or of convoys, in case the attack succeeds. It also arranges that telephone lines, optical telegraphs, and wireless apparatus shall be ready to be put in operation beyond the departure position.

. . .

The shattering of the enemy's position is intended to facilitate the advance of the infantry,



FIRE OF THE FRENCH ARTILLERY ON THE ENEMY'S LINES ON THE SOMME

The French soldiers can watch the effects of the fire, since the enemy has been obliged to burrow in his shelters

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by destroying defensive works and silencing the enemy's batteries.

It is executed throughout the whole extent of that position, and of adjacent positions, and is extended *pari passu* with the advance of the guns. This permits an easy, continuous, and deep advance.

The artillery plan of action arranges the grouping of the pieces, fixes their situations and zones of action, determines their duties, organizes their liaisons, arranges for their supply, and makes plans for their displacement. Such groups are never huddled in a narrow space; they are echeloned in depth, not according to calibre or range, but according to the tasks which they must fulfil. Moreover, the disposition of the batteries is largely influenced by the expected development of the attack. Certain batteries are sometimes placed very near the front line so as to be in place as soon as the advance begins; in such a case it is essential to have them properly sheltered and protected by camouflage; they should not be revealed to the enemy before the moment when they can be of use.

While these groups are being installed, the trench artillery takes its station and establishes its ammunition dépôts. The transportation of bombs for the trench mortars is by no means easy on account of their weight and the diffi-

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culties of passage through the boyaux; some ammunition should be brought up at every convenient opportunity; as, for instance, when a fatigue detail goes to the front line. All ammunition necessary to carry out the mission entrusted to the trench artillery must be transported to its destination by the day fixed for the beginning of the preparation.

When the artillery pieces of all calibres are prepared to open fire, the observation service, both in the air and on the ground, becomes more and more active. This service must furnish all the details for adjusting the fire, and note, day by day, the progress of the shattering.

The airplanes communicate with the ground by radio telegraph, wireless telephone, projectors, weighted messages, and rockets. For fire adjustment, the wireless receiving stations signal to the planes by means of cloth panels. The airplanes must also drive hostile aircraft away from the position, lest they discover the preparations for the attack.

Balloons communicate with the ground by telephone; the anchorage is in telephonic or radio-telegraphic communication with the artillery. They must remain half a dozen miles from the front line on account of their vulnerability, and at an altitude not exceeding some sixteen hundred yards on account of the wind.



The village of Maurepas



The least destroyed part of the village of Maurepas

EFFECTS OF THE FRENCH ARTILLERY PREPARATION AT THE BATTLE OF
THE SOMME (JULY-NOVEMBER, 1916)

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When all these arrangements have been made to overthrow the enemy's position, the artillery preparation begins. It is continued long enough to obtain a complete result; it may even be kept up some days longer, till the day when the attack is let loose. This day cannot be absolutely fixed in advance; atmospheric conditions have such an important effect upon the aviation, the artillery fire, the march of the infantry, and the liaisons, that they may not be ignored.

The air service begins by blinding the enemy. To this end the airplanes swoop down upon his balloons and drive them to the ground; they get the upper hand of his planes, driving them off as soon as they appear. This obviously puts the enemy at a disadvantage; he is a target for fire, but cannot shoot back with any certainty of effect. Such a condition was established at the beginning of the battle of the Somme in July, 1916, and maintained, at least in part, during the months which followed. The Bulletin of the Sixth Army gave us weekly an eloquent comparison of the success of French and German aviation.

The artillery pieces of different calibres perform different duties. The trench artillery smashes the enemy's first lines; the field artillery shoots at his accessory defences, his troops, and his batteries; if necessary it delivers a barrage;

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the heavy artillery destroys defensive works and hostile batteries, the condition of which is always clearly marked on the fire map; the high-powered artillery accomplishes the same sort of thing against better resistant or more distant objectives.

Artillery preparation is carried out, not only against the first position, but against succeeding positions. It has the further use that it impedes the forwarding of supplies, reserves, and reliefs; the zone to be attacked is surrounded by a circle of fire.

The airplanes which follow the artillery preparation can give it active support by bombing tactical objectives such as railway stations, junctions, ammunition dépôts, centres of communication, etc.

The infantry sometimes feigns an attack in order to see if any means of defence, such as machine guns, are still intact.

The engineers may help in the shattering of the enemy's position by exploding, at the last moment, mines laid beneath important points, such as flanking works. It is, however, a mistake to exaggerate the usefulness of these mines; their effects are purely local and are frequently disproportionate to the efforts which they have cost.

The effect of the artillery preparation is some-

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times so great that scarcely anything remains of the positions taken under fire. The pictures in the illustrated papers have often shown us villages which were completely wiped out, or woods reduced to a few tree-trunks cut off at different heights. The most complete destruction of this sort which I, personally, have ever seen, was that of the villages of Hardecourt and Maurepas on the Somme, attacked by the French in 1916. The destruction of these villages was carried out to such an extent that, little by little, it became impossible to determine where they had been; the débris of the houses was used to ballast the roads; otherwise it would have been necessary to bring stone from a great distance. One day I was traversing the region in company with two British officers, Colonels Leggett and Robertson. When they reached the spot where Hardecourt had been, they looked at the battle map which I had given them, and asked me: —

“Where is Hardecourt?”

“Right here; you must be in the centre of the village.”

The artillery preparation had certainly been good; in fact, the first stages of the attack had been marked by insignificant losses.

A commander should under no circumstances launch an attack until he is satisfied that the

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artillery preparation has been sufficient to allow the troops to advance. Sending troops against a position which is but slightly damaged is not only a crime, but a useless crime, since such an attack is bound to fail. For this reason it should be permissible for officers of every grade to point out possible improvements in the fire preparation. Such freedom should not occasion abuses, or serve as a cloak for lack of dash or courage. On the other hand, when well used, it may save many lives and so contribute to success.

A specific example, backed by documentary evidence, may serve to show what sort of thing is going on in the mind of a commander of a small unit at the time of preparation for an attack. This example is illustrated by the advice which I took it upon myself to give, in May, 1915, to my superiors, Colonel Pesme, the commander of the Sixty-ninth Regiment, and General Aimé, since fallen at Verdun.

There was nothing but the heavy artillery which was able to shatter the Labyrinth, or even to destroy the first-line organizations. I had not had the time, during my short stay in the trenches, to determine completely the organization and strength of this centre of resistance; I had, however, realized its importance, and I was curious to know, before the opening of the assault, just what were the results of the artillery

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preparation. I was, therefore, very glad when an order came to the officers in the waiting cantonments to go, with their artillery comrades, on May 3, to *Cote 107* and receive instructions from the brigadier-general.

General Aimé gave us information and offered us advice. He finally pointed out the importance of the artillery fire, already executed or still in prospect, and notified us that for the four companies constituting each wave there would be sixteen breaches opened in the enemy's wire entanglements. He added that thereafter the success of the attack would not depend upon the majors of artillery, but upon the majors of infantry. He then suggested that these two groups of officers should carry out together all of the reconnaissances which might seem to them useful.

At that point Major Gouvy, whose artillery battalion had rendered me valuable assistance in Belgium, asked permission to speak. He wished to say before everybody that the infantry need not expect to find sixteen breaches opened and cleared with mathematical exactness; the defences would be destroyed as thoroughly as possible at sixteen different places.

We then went off on reconnaissance, and this gave me, personally, a chance to examine thoroughly our fire preparation, to question the

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artillerymen of every grade, to go into the observing stations, and to study the views, to take account of the results of the fire, and to examine the telephonic connections. I was disillusioned by my investigations, and thought it my duty to communicate the fact to my superiors.

At 8.50 o'clock on that same evening I sent a telephone message to my colonel upon the subject, and told him that I was sending a detailed report to the brigadier-general. This report, which I drew up forthwith, was in the most precise terms; for instance, it read: —

“The responsibility laid upon the infantry battalion commanders for the success of the task assigned to each is a flattering honor for them, but they cannot undertake this responsibility unless the liaison between them and the artillery battalion commanders is perfectly secured, both during the preparation of the attack and during its subsequent phases. Now this liaison is still open to improvements which are important, not to say indispensable.”

I then studied the different phases of the approaching combat, in which my battalion was required to pass the first waves and go right to the objective. The artillery were expected to prepare the attack on the first German line, yet even in fine weather they could see from their observation posts *Cote 94* near *Marœuil* (see I: 80,000

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map) only a part of the defences to be destroyed, and could not sufficiently judge the effectiveness of their fire. During the fight in the interior of the position, they would be unable to maintain a proper liaison with the infantry either by visual or telephonic means.

“Not by visual means,” I wrote, “because they will not be able to see the red flags with which the infantry will signal; they will not even see the general situation of the line of infantry itself; nor yet by telephone, because the eight or ten lines which I have seen are all aerial ones. These lines, which are carried on single poles, will certainly be cut at the beginning of the assault, repairs will be difficult, and will if attempted probably result in mixing up different lines.”

I made plans, not only for moving forward the artillery observation posts, but also for the preliminary installation of a battery in an advanced position in order to avoid the difficulty of subsequently having to move it forward under fire. It would not reveal its presence except at the word of command, during the progress of the action.

“Of course,” I added, “this battery will be subject for some hours to the same risks that the infantry habitually run, but it will be protected in the same fashion, by counter-batteries endeavoring to silence the enemy’s artillery. The

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circumstance of having some of their own comrades in such a situation will serve to quicken the zeal of the artillerymen."

This latter suggestion would have been impudent and unjust, if it had not been intended merely to draw attention to the importance of providing a counter-fire against that artillery which might eventually stop the progress of my battalion.

I concluded in these terms: —

"The necessary improvements would seem to be the following: —

"(1) Replace aerial telephone lines by underground ones.

"(2) Discover, by means of reconnaissance, situations for observation posts much nearer the scene of action; such, for instance, is the post of the Famelard battalion before Écurie. From there the artillerymen can watch the movements of the infantry, ascertain the results of the fire, and receive, after brief delay, liaison agents sent back from the front. By constructing several such posts, the artillery observers could go to them as necessary, and change from one to another, in case of bombardment.

"(3) Detail to each battalion commander artillery observers having a perfect knowledge of the terrain *as seen from the artillery observation posts*, whose duty it shall be to inform the bat-

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teries, in accordance with the preliminary artillery sketches and plans, what points should be subjected to fire. Any other proceeding would give rise to unfortunate misunderstanding, owing to differences of nomenclature and a complete change of outlook.

“(4) Let the battalion commander be followed by a telephone line at as short a distance as possible.

“(5) Arrange beforehand for the rapid displacement of some batteries or the preliminary stationing of one or more nearer the first line, for instance, near Écurie, in order to facilitate the progress of the infantry toward its objective, and to *insure the continuity* of the movement toward the north. At the same time arrange for the displacement of the observation posts.

“The success of the attack would not, then, seem to depend upon the majors of infantry, but on the commanders of artillery battalions, whose duty it is to open a road for an ardent and enthusiastic body of troops, joyfully offering themselves as a sacrifice for victory.”

The general called us together again on the 4th of May at Haute-Avesnes for a rocket signal test intended to perfect the means of liaison between the infantry and the artillery. My report had not yet reached him, but this seemed to

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me a good chance to inform him of its contents. He heard me with great kindness and took notes upon his pad on what I said. In fact, he was always trying to improve the preparation and would have brought it to perfection had there been a few more days available; but we were only recently arrived, and it is always necessary to be liberal in counting the time required for the preparation of an attack.

By adopting the principle that the commanders of the attacking units have the right, and, in fact, the duty, to point out to the Command those parts of the front line where they believe the artillery preparation to have been insufficient, there will be a real gain in keeping up a proper spirit, in comradeship, and even in discipline.

There was, indeed, one question which frequently arose in our intimate discussions: suppose that the commander of an infantry unit finds out that the artillery preparation is notoriously insufficient, is he, nevertheless, obliged to obey the order to attack, and to lead his men to a certain and useless death? For my part, I never hesitated to reply in the affirmative, for if the right is given to any soldier to discuss his orders and not to execute them, then discipline is no longer possible. But the absolute right to send men to death imposes upon the Command an immense responsibility which it must recog-

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nize; an officer who needlessly sacrifices the lives of his subordinates should receive a more serious censure than the gruesome but indirect one, so often contained in the citations of the *Journal Officiel*: "Died valiantly while trying to cross an undamaged section of the enemy's wire entanglements." I have never been able to read these lines, so often repeated (in the case of other corps than my own), without a shudder of indignation and horror.

. . .

The preparation of an attack requires, finally, the physical, professional, and moral training of the troops.

The physical training is given in the region behind the Front, whither the attack units are sent turn and turn about. A stay in the trenches has the effect of stiffening the men's bodies; it is important that, at the moment when the great effort must be made, their full measure of suppleness, agility, and endurance shall be restored. Bayonet exercise is excellent for this purpose, as are football, baseball, running, and jumping. Marches are useful for conditioning the feet and legs, to meet the possibility that success might involve a long pursuit; but, in general, the exercise should be as amusing as possible, to keep up the spirits of the men.

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The soldiers are cautioned to avoid every sort of excess, especially excess in drinking. Not only is the abuse of alcohol a degrading vice, but it diminishes a man's efficiency for the combat, since alcohol poisons the blood. Alcoholics die of wounds which are not fatal to men whose blood is pure.

I think it wise before a combat to avoid over-feeding. I have noticed that my comrades followed two opposing theories in this matter. Many of them ate a heavy meal the day before the attack, because they foresaw a lean period for several days to come; others, including myself, ate lightly on that day; we believed that the human body is better able to resist the effects of wounds if not engaged in the process of digestion.

It is indispensable that the soldier should carry on his person all that he may need on the days of the attack, without, however, being burdened with a useless load. In the Twentieth Corps every regiment had worked out a light fighting kit; the men left useless articles with the company wagons and carried with them ammunition, food, water, and other necessaries. I personally saw to it that every one of my men had a full water-bottle, a blanket, and a tent-cover, for a soldier who suffers from hunger and cold is in danger of losing his morale.

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I am not in favor of the practice of distributing alcohol before going to the attack; I have never given it out to my men, and I have never regretted this policy; they have always done better without it. I suppose that a certain number of soldiers, affected by alcohol, without being actually drunk, lose their sense of danger; they then expose their lives uselessly in a way they would not do had they all their wits about them. Probably it is just to remove this anxiety that they ask for alcohol. In my judgment alcohol is not needed for troops with a finely tempered morale.

In the period preceding an attack military instruction should be resumed, in order that the liaison between the different arms and the co-ordination of the various specialties may be in perfect working order. A unit, such as a division, should be sent, for perhaps a fortnight, to a camp near the army schools; it can thus utilize the teachers and material equipment of these schools. The instruction in specialties should be reviewed by means of short individual exercises; the instruction of the small units should always be given with the specialists in their places. During this period the generals should perfect the training of their subordinates by collecting the available officers for special exercises on the ground.

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After all this has been done, it is necessary to organize combined manœuvres, in which every phase of the conflict — the attack, pursuit, and march of approach — is rehearsed. The formations to be adopted, the rôles of the various arms, and the duties of the specialists are different in these different phases; a fact which is too often overlooked. Manœuvres of the large units are quite as important as those of the small ones; for instance, it is only in these large manœuvres that it is possible to find out what practical difficulties may arise in the course of the attack, such as difficulties for the Command or for the system of liaisons. These manœuvres should be carried out under conditions as closely analogous as possible to those which obtain in actual combat. There is no other time when it is possible to study the liaisons between the different arms, to practice the infantry in marching under the eyes of the accompanying aviators, to give the artillery a chance to advance by rushes, to effect the relief of exhausted troops by others going past them.

The moral preparation of the soldiers is a long-continued process which cannot be relegated to special days or special hours, but must result from the ever-present influence of men of high standards. The officer must be a watchful shepherd of his men. His example and the nobil-

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ity of his character must excite their enthusiasm and stimulate their spirit of sacrifice.

Every sort of faith and conviction should be cultivated in the soldiers who are going to fight. Love of country has a peculiarly strong effect on ardent souls; the love of liberty spurs every citizen of a free country to overthrow the oppressor; the love of humanity summons every honest man to stop the barbarians from further crime; faith in God fills the believer with contempt of death; confidence in their commander brings to the soldiers the certainty of victory.

In the days which precede any event as solemn as an attack for the men in the first line, impressions take on a peculiarly vivid form. There are moments which remain ineffaceably engraved upon the minds of all who manage to survive in this mighty drama, be they moments of enthusiasm, of tenderness, or of sadness.

How well I remember the review in Belgium, where my regiment was encamped next to the little village of Woesten. It was then that I received the cross of the Legion of Honor at the hands of my general. I have no words to express my feeling at that moment. Many a Frenchman will face death just to see the emblem of glory in the shape of the cross of the Legion of Honor or the Croix de Guerre pinned on his breast. What we see in such a cross is the symbol of that

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courage which we love, of that spirit of sacrifice which we admire.

The reviews which are held in the vicinity of the Front have often a different character from those held in time of peace, because they affect the soldiers deeply. I held a review a few days before the offensive in Artois April 20, 1915, at Conteville. I massed my men in a somewhat theatre-like arrangement. I made them an address upon the attack which we were going to deliver. I promised that they might rely upon their superiors, and upon myself; that we knew the value of French lives, and would not shed their blood in vain. I showed them the necessity of making an end of our barbarian enemies, and pointed out what glory awaited them after victory. In conclusion I called up the vision of their return, accompanied by the plaudits of the whole of France, and their triumphant march down the Champs Élysées, with flowers in the ends of their guns. Phrases, which it would be pointless to repeat now, found that day an echo in the heart of each, owing to the solemnity of the moment. I could read on the silent faces of my brave men the signs of their devotion and their resolution.

In the days which precede the attack there are, besides the moments of enthusiasm and exaltation, moments of disquieting melancholy. Each

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is ready to sacrifice his life, yet he cannot help wondering whether, indeed, it is his fate to be one of those left on the field of battle. I remember one sunny day at the end of April, 1915, when I was lunching with my brave and devoted Adjutant Huron in a little village behind the Front. I said to him, looking out of the open window at the fruit trees in flower: "How pretty the country is at this time, Huron, and what a pity it seems that we shall never see the leaves come out green upon these trees." I was looking so attentively at the apple trees in blossom that I still seem to see their flowering branches.

It is certain that the idea of death is at first disagreeable when one is young and strong and in good health, and in the enjoyment of all that makes for happiness. But one becomes used to it, little by little, and acquires a sort of resignation. This resignation is peculiarly striking in the case of men who believe in God, because they see, beyond this earthly life, the heavenly life awaiting those that are called thereto. The religious instinct is strongly developed in time of war, at least among the fighting troops, as, indeed, it is at all times when Humanity is suffering. Just as in the Middle Ages unhappy multitudes found in their churches a source both of comfort and of hope, so at the Front the soldiers come in

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crowds to the little village churches, or to the altars in the open air, that they may pray to the God of armies and find rest in Him.

I have been present at many a touching scene, like that of the 8th of May, 1915, during the night that preceded the attack on the Labyrinth. It fell to the lot of my battalion to lead the Sixty-ninth Regiment. I left the little village of Hermaville shortly before midnight, to go to my departure station in the trenches. My battalion was to assemble on the road leading to Marœuil. The night was dark. The companies were drawn up along the road, silently awaiting the moment fixed for their departure. Thereupon the Catholic chaplain of the regiment asked my permission to perform his sacred office during the few moments which remained. I gladly granted his request, and he turned to the first company, with these words:—

“Dear friends, you are going out to fight. In a few hours many of you may have fallen for your country. Turn your thoughts for one moment to God, ask Him to forgive your sins. I will grant you absolution. Let every man who believes in God kneel down.”

Before me there were Catholics, Protestants, Jews, and atheists. I saw in the darkness every man on his knees; not one remained standing. The chaplain granted absolution. In every one

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of my companies there was the same address, and the same result.

I wished to add my own words of encouragement, in my capacity of military leader, to those of our spiritual guide. I collected about me all of my company commanders and all section or platoon leaders in my battalion. I spoke a few words to them, ringing with confidence and hope, then I shook the hand of each, asking each to repeat his name, because I could not distinguish faces in the darkness. And then as I heard their names I felt their strong and hearty hand-clasps conveying without words their affection and their devotion. Little by little my throat contracted and my eyes became dim, but it was dark and none could see. When I had taken the last hand in mine, I said simply: —

“Good-bye, friends; let us all hope to meet tomorrow at our objective, The Lindens.”

Ah, there was many a one of those brave hands that I was never to grasp again!

I was not satisfied that day to have come in contact with the officers and N.C.O.'s; I meant also to reach the men. While my battalion filed along the road leading to Marœuil, several miles from the trenches, I rode past the whole column on horseback, stopping alongside of each section or rank of soldiers and saying a few words to each. I could perceive, in the replies of those

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noble fellows, all their affection, all their confidence in me, and I was deeply moved. There is no higher moral satisfaction than to have men devoted to one's self because one has been able to touch their hearts. The leader who feels this realizes how much he must labor, and ponder, and sacrifice himself in order not to waste the precious lives so freely given to his care.

It must always be the constant care of each officer not to risk the lives of his men needlessly. I had filled my officers and N.C.O.'s with this same idea, and I tried by every means to establish between us a perfect accord of thought and feeling. It was I who had given the last touch to their military training by drawing tight the bonds which should unite all officers of a small unit such as a battalion. In rest camp I used to summon them to familiar discussions in the parlor of an inn or the bedroom of a farmhouse. I brought the notes drawn up by the High Command, as well as my own personal ones, since published in the "War of Positions." After a short exposition, I allowed each one in turn to offer his opinion, and justify it by examples drawn from recent combats. We thus elaborated, under my authority, our tactical system for the small unit; we combined our intellectual and moral strength, as well as our physical powers, in the common task of hastening victory.

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I shall never forget those little meetings — they were so hearty, so intimate. There was the last one, for instance, before the attack on the Labyrinth, held at Marœuil April 24, 1915, in a little house at the entrance to the village. I then explained to my officers and N.C.O.'s all my ideas as to the support which they might expect from the artillery, as well as those dealing with the necessity for liaison with neighboring bodies of infantry, with the artillery, and with the Command. Little by little I felt their hopes for victory take shape and their confidence increase.

Confidence, — that is the feeling which a commander must at all times and at all seasons instill into his subordinates. On the morning of May 9, 1915, my companies of the Sixty-ninth, after having passed by Marœuil, had arrived at the ruined village of Écurie, enmeshed in the trenches from which we were to start. To reach their departure station, my men had to go past *Cote 107*, where there was an observation post giving a view of many of the enemy's positions. I took my place therein. The fire of our artillery, which was infernal at that moment, was making a deafening roar, knocking the German trenches to bits, and raising a dust that filled the atmosphere for a long distance. I exhibited the greatest satisfaction with what I saw,

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dilated upon the effects of our projectiles, and called frequently to my liaison N.C.O.'s or to my officers: —

“There won't be any Germans left when we get there.”

The fact was that I was afraid that my doubts as to the success of the preparation might have filtered down to my troops, and I was anxious to keep their confidence and enthusiasm intact.

The disadvantage of this procedure, which consists in over-exciting the troops, is that the reaction is all the more violent if the attack does not succeed; and it is hard to restore their confidence for another effort. It is, therefore, better to give up an attack entirely than to try one which has not every chance of success; not only does a check incur serious losses, but it seriously weakens the morale of the survivors.

But an attack which has been carefully prepared, and whose different phases have all been carefully foreseen, *ought to succeed*. No form of defensive works can resist the fire of heavy cannon and of trench mortars. The infantry should reach the enemy's first line with great ease. Thereafter the combat depends upon the qualities of the officers and the training of the troops. A good start increases confidence, and confidence, backed by matériel and artillery fire, is the advance guard of victory.

V

THE ATTACK

LECTURE OF NOVEMBER 12, 1917

SUMMARY

Object of the attack. — Choice of date. — Secrecy during the preparation; rapidity in execution. — Rôle of the different arms. — Swiftmess and continuity. — The phases of the attack on a position.

Attack of the first-line trenches. — Plan of engagement. — Formations for the attacking units: the waves. — Moments before the attack; trial waves. — The first wave or line of combat. — The meaning of the word "waves"; confusions to be avoided. — The mechanism and march of the successive waves. — The place of the commander. — The moving artillery barrage. — The liaison between the line of combat and the artillery. — Aircraft. — Rôle of the tanks. — Rôle of infantry weapons. — Curtains of steam; clouds of gas; streams of liquid fire. — The success of this phase depends upon the preparation of the attack.

The struggle inside the position. — Shell holes; nests of resistance; trenches on counter-slopes. — March of the line of combat. — The liaisons: ground and aerial observation; accompanying planes; balloons; code of signals; telephone. — Rôle of the artillery: moving barrage; neutralization of the enemy's artillery; direct support of the infantry. — The liaison between the artillery, the command, and the infantry. — The centre of information of a division. — The forward displacement of the artillery; its support of the infantry; an example. — The manœuvres of the infantry. — Trenches on counter-slopes. — Rôle of infantry weapons. — The tank considered as an infantry cannon. — Relief of the line of combat by passing. — The direction: necessity of compasses. — March of the reserves; their rôle and that of the engineers. — Night fighting: *coups de main*; rôle of the artillery and the aircraft. — Forwarding of reserves, munitions, and food.

The organization of the conquered position. — Plan of ensemble. — Same principles as for the organization of a position.

Uselessness and danger of partial attacks. — Exception for the observing stations. — How the attack of a position can succeed.

THE object of an attack is to obtain possession of a position, and then pass on to other positions

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beyond, in order to strike the enemy's army, to pursue, and to destroy it.

An attack is launched on a day determined beforehand. The choice of this day depends upon strategic considerations which are settled by a superior council of the allied armies, if the attack is carried out by several nations, or by the General-in-Chief, if it affects the strategic plan of one nation alone. The choice of day may also be affected by political exigencies, such as the psychological effects of a success, even if only a local one. Under all circumstances, however, this date must be chosen with due regard to the success of the artillery preparation and the state of the weather. If the defences of the hostile position are intact, or only partially destroyed, an attack has no chance of success. Similarly, if rain renders the ground slippery and water-soaked, if fog prevents the airplanes from flying and the artillery from adjusting its fire, the attack will be started under unfavorable conditions.

An additional element needful for success is secrecy during the period of preparation.

This secrecy is insured by imposing rigorous regulations upon correspondence, so that men who are present during the preparations carried out along the Front shall make no mention of them in their letters. Soldiers, like the civil pop-

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ulation, should be impelled by patriotism to keep silence about everything having to do with the course of the war. Many persons who consider themselves loyal patriots cannot resist the temptation of repeating any information they may happen to obtain, merely for the pleasure of appearing to be "on the inside"; it is a serious fault. Even newspaper men must learn to drop their professional habits, and submit themselves to the same discipline of silence; a single indiscretion might cause the death of thousands of their fellow-countrymen, by bringing information to the ears of the enemy. "Taisez-vous, méfiez-vous, les oreilles ennemies vous écoutent!" This familiar phrase, which every one has read in Paris, has often proved to be true.

Rapidity of execution consists in launching an attack just as soon as the preparation is complete; leaving the enemy as little time as possible to make ready for the danger whose approach he must have foreseen during the last days. There should be no pause between the time of beginning the artillery preparation and the launching of the attack; the enemy will thus have no chance to gather himself together. On the other hand, if an artillery fire can be maintained, even in those sectors which are not favorable to an offensive, the enemy will not know, till the very last minute, just which point of his

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line is endangered; the attack will be in the nature of a surprise.

All arms come into play in the attack. The artillery continues its preparation of the position as a whole, and of successive positions; it protects the infantry by batteries giving direct barrage support, by batteries following the enemy's movements, and by counter-batteries. The infantry occupies in turn the various parts of the terrain which have been swept by the artillery, and organizes them. The aircraft prevent the enemy's aviators from adjusting his artillery fire and from obtaining information; they also accompany the infantry. The engineers are busy helping the different arms to advance, keeping them under cover, and holding the ground which has been won.

To seize a position, it is necessary to overcome those of the enemy's troops who have remained at their posts, and to seize the batteries of artillery, one behind the other. Speed and continuity are the two essentials to this end, for they prevent the enemy from reorganizing at successive well-chosen points.

The attack develops in succeeding phases which have varying characteristics and demand different forms of battle tactics. Many people, blind to this fact, wish to lay down invariable rules for the troop formations and the choice of weapons.

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An attack develops in the following phases, of which no two are alike: —

The attack on the first trenches.

The daylight struggle inside the position.

The fight during the night.

The organization of the conquered position.

The study of these successive phases shows that there are special rules for each.

. . .

The grouping of troops for the attack is carried out according to the orders laid down by the commander of each unit in his plan of engagement.

The smaller the unit, the simpler is this plan, but it is absolutely indispensable, if each man, whatever his grade or function, is to know just what he is to do. It establishes that most important of all liaisons, unity of idea and of will, because it indicates what are the Commander's wishes and the task and objectives of each unit. It also gives needful details as to the formations to be adopted, the liaisons to be maintained, the use of machine guns, the watch for possible breaks in the line, and the measures to be taken in case of a counter-attack. It finally gives the starting-time or signal of the attack.

The troops are drawn up in successive "waves." The first wave is stationed in the

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departure parallel, if there be one, otherwise in the first-line trench; it is provided with the necessary means of egress. The following waves are stationed in the doubling, transversal, or support trenches, and in *places d'armes* especially constructed to shelter them. It is, in fact, necessary to try to reconcile two somewhat incompatible conditions; to hold the troops ready to move forward without delay, and to avoid exposing them to bombardment in compact groups.

The moments which precede an attack are solemn, indeed. The men know the hour fixed, they await it with stoic resignation. They are generally silent; each one draws into himself, and struggles with his instinct of self-preservation. In those brief moments one's thoughts turn instinctively to one's nearest and dearest, mother, wife, sister, sweetheart; a thousand details of one's former life, of familiar scenes, of old friends, pass through the mind. These moments of silent waiting are most painful for those whose morale has not been well tempered; they must be made as short as possible by not bringing the troops to their departure station any sooner than necessary.

A man is profoundly affected by his first attack. The young soldier who is to go over the top makes frantic efforts not to appear too much upset. There is a story of a man who was at

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the Front for the first time and who was shaking in every limb while awaiting the starting signal.

“Well,” said one of his companions, “are you trembling for your skin?”

“No, not for mine, for Fritz’s; he does n’t know I’m here.”

Jokes of this sort are sometimes made by men who are trying to keep up their courage or hide their fear, but they form an exception; the moment is too solemn.

This is the time when the leader may exert a most powerful influence by his personal attitude. He must inspire his subordinates with the confidence needed to leap over the parapet with complete steadfastness of mind.

It is sometimes useful to start a sham attack before the real one is launched, in order to see whether the enemy’s watchers are on the alert and if his machine guns are still in place and, consequently, if the preparation has been sufficient. The most practical scheme is to send out trial waves, usually composed of volunteers, at times specified in advance. If the enemy is not sufficiently disorganized, he will receive them with a fire which will show the situation of his barrage batteries and machine guns. This will enable the artillery to destroy them. Moreover, when the enemy comes out from his shelters to receive the wave which he believes to be the first

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one of the attack, he is met by a redoubled artillery fire which causes him losses. If this trick be repeated two or three times, he will not come out when the real attack is launched.

It is also possible, when sending out trial waves would be too dangerous, to execute a sham attack by means of artillery fire; certain batteries force the batteries of the enemy to unmask, thus causing them great damage.

The attack on the enemy's first trenches begins at a moment specified in the plan of engagement. The word "assault," by which we often designate this advance of the infantry, is likely to give rise to false ideas. In its usual sense it means a violent operation, in which the infantry flings itself forward as quickly as possible, in order to fight the enemy hand to hand. The present form of attack bears no superficial likeness to this old type of assault.

The first infantry line, or fighting line, leaves the departure trench at a footpace, in deployed formation. It does not fire during its advance, but is preceded by an artillery barrage. This formation astonishes people who have heard nothing of modern warfare, and who are haunted by visions of advanced guards, flank guards, and rear guards. The advanced guard was used for reconnaissance and for protection; now the objectives, or, at least the first ones, are perfectly

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known by means of photographs; as to the protection of the troops, that is effected by the cannon. Flank guards are no longer possible because the Front is continuous; they are replaced by liaison groups and other means of contact, so long as the chances of combat have not made gaps in the line. Finally, the rear guard has no longer any *raison d'être*; it is superseded by an echelonment in depth, and by the great lines of the supply and evacuation services running back into the interior of the country.

The word "waves," used to designate the successive lines of the attacking troops, calls up a vision of the billows of the sea. The comparison is correct in so far as the lines succeed one another without interruption, as the sea combers dash upon the beach; it is also correct in so far as waves pour over an isolated obstacle, such as a rock, and reunite beyond; but it would give quite an erroneous impression of the combat if one imagined that the human waves dash themselves one after another against an impassable barrier. Under these circumstances, the first wave should halt, and the others come to a standstill wherever they are.

The uselessness of infantry assaults against powerfully defended objectives should be constantly emphasized in every way, shape, and manner. Such assaults have cost the Allied

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armies hundreds of thousands of lives. I wrote in the beginning of 1915: "The contest between a human projectile and a metallic one is uneven."

The word "waves" has caused regrettable confusion. The first wave is, in fact, composed of two successive lines of combatants, sometimes also called, by analogy, "waves," and a third line of trench-cleaners or "moppers-up," called the "third wave." Unlike the proper procedure for the following waves, the three lines of the first wave may unite in the first line when that one meets an insuperable obstacle. On the other hand, the following waves must keep their distance, so as not to increase needlessly the density of the fighting line, but to maintain echelonment in depth.

The approximate distances between the various lines of the first wave are governed by the regulations: about fifteen paces between the first two, twenty paces between the second and the third. The regulations indicate the distribution of the different specialists, such as hand grenadiers, rifle grenadiers, and automatic machine riflemen, among the lines of the first wave.

I do not wish to enter into the details of this formation, as that would merely encourage a mistake that is already too common. There is a tendency to memorize the distances between the

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lines and the distribution of the specialists, as if therein lay the secret of victory; and when there is a change in the proportions of the different specialists in the company, or when the distances between the lines are slightly modified, people say that war has been changed. I remember how, during my first combat exercises with the Harvard Regiment, the young soldiers would halt in a place exposed to front and flanking fire, in order to rearrange their lines at the regulation intervals. I am certain that they would not have done this in battle. Moreover, after a little while they acquired the consciousness of the enemy's presence, and adopted principles based on common sense and the instinct of self-preservation.

The second wave follows the first in a similar formation, at a distance of about fifty paces; its third line also is composed of trench-cleaners. The second wave may be accompanied by machine guns.

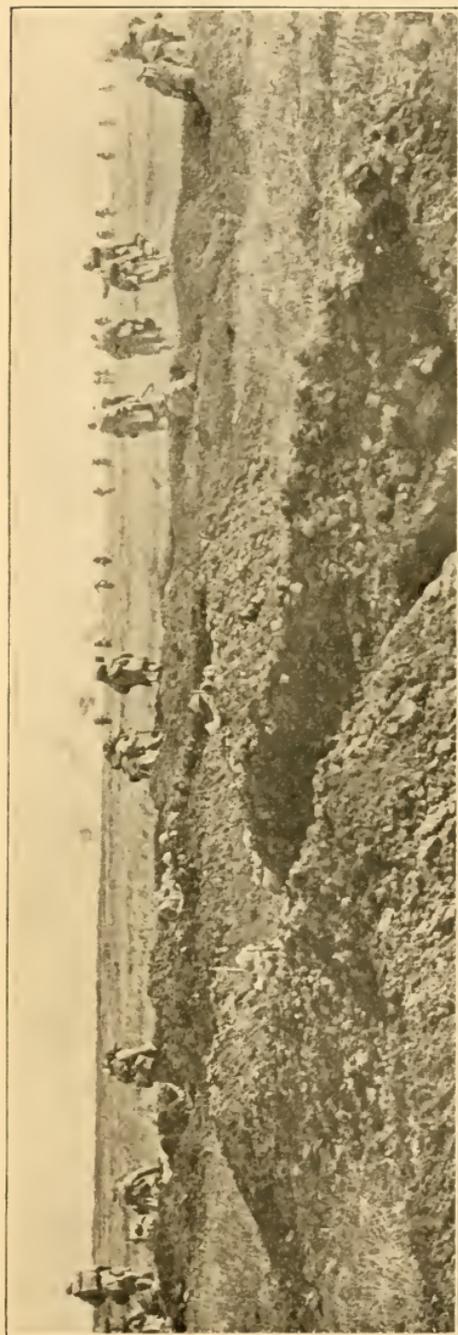
The succeeding waves are at varying distances; the third, for instance, is two hundred yards behind the second. Instead of being deployed in line, it is made up of small columns, to facilitate marching and manœuvring. The machine guns and 37-mm. cannon usually go with this wave. The following waves are also in small columns.

The waves are made up of units, in close touch

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with one another and echeloned in depth. This form of echelonment is, in fact, a fundamental principle of attack offering many advantages. It enables the leader to command his unit with ease and to manœuvre from the start; it facilitates the reënforcement of the fighting line by other men of the same unit, familiar with the same leaders, and knit together by *esprit de corps*. It maintains order and cohesion for two reasons: first, because all detachments of the same unit march automatically toward the same objective and have the same rallying-point; and second, because these detachments can be watched from the rear by a small detail, whose presence serves to urge forward any soldiers tempted to loiter in a shell hole or trench.

The place of the commander at the start is indicated on the plan of engagement. This is no more unalterable than are the other dispositions, but it is governed by certain fixed rules. The only leader who can survey his whole unit at once is the section leader, and even this unit is often split up into little groups, in each of which the bravest and best man takes command. The combat group should, therefore, be rather the platoon than the half-platoon; it is always under the command of a leader who commands and guides it. The platoon leader in a fighting wave marches in the second line; the platoon



Advance of an attacking wave behind an artillery barrage. The second line of the wave leaves the departure parallel a little after the first



March of the first waves behind the moving barrage. A captain with his liaison agents in two small columns

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leader in a reënforcing wave marches at the head, in order to guide his men.

In the case of a company, the captain marches in front, so long as the engagement has not begun; when the men are engaged, he marches with the fighting wave in order to direct the movement, but takes care not to lose liaison with the reënforcing units. In a battalion, the major marches in the lead so long as his unit is not engaged; thereafter he is often at the head of the reënforcing company, and always in the place whence he can best guide the action.

The commander must take care not to expose his life from mere bravado or love of glory, as so many officers did at the beginning of the present war. In the first combats the French officers, who were distinguished from the enlisted men by their uniforms and their stripes, their képis and swords, were a particular target for the German sharpshooters; the recent graduates from Saint-Cyr arranged to go to the assault with plumes and white gloves, as though to a fête; this ill-advised exuberance caused many to fall victims to the enemy's fire. Not only have the officers to-day cut down their stripes to a minimum, but they wear exactly the same uniforms as do the enlisted men and do not even carry swords. There are plenty of chances for a man to be killed in the discharge of his duty, without his

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having to hunt up others. The commander should not risk his life unnecessarily, because his troops have need of him.

At the chosen moment or at the specified signal, the three lines of the first wave leave the trench together, in order to avoid the hesitation or delays that might come from successive departures. The intervals between the three lines are assumed in the course of the advance.

The succeeding waves leave at the command of their respective leaders, either by going to take their stations in the departure trench or by starting directly from the trenches where they are. Their echelonment is so arranged as to facilitate reënforcement, relief, and manœuvring at the proper moment, and to effect the occupation and retention of the designated objective.

The first wave or fighting line is preceded by an artillery barrage, which advances continuously and is intended to clear the enemy's trenches as much as possible. The rate of advance for this fire is precisely that specified for the infantry before the attack. This rate is determined by the difficulties of the terrain, so that the barrage shall not advance more rapidly than the infantry and give the enemy a chance to come out from his shelters. It is usually one hundred yards in three or four minutes. Fur-



GERMAN SOLDIERS SURRENDERING TO THE MEN OF THE FIRST FRENCH WAVE, BATTLE OF THE SOMME
JULY 2, 1916

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thermore, the range of the preparatory fire on the position is not lengthened except as the infantry advances.

The fighting line follows the barrage as closely as possible; it reaches the limit of the zone covered by the explosion of the shells. The nearer the infantry are to this zone, the better their chance of finding the enemy hidden in his shelters or places of refuge. Certain officers have maintained that this fighting line should follow so closely that ten per cent of its effectives should be put out of action by its own artillery barrage; if it is farther back, say these critics, it will be even more cruelly decimated by the enemy's fire. But we cannot admit such a principle, or sacrifice the lives of soldiers, by firing on them, unless we are certain that they are running the most serious risks in approaching the enemy. The advance of the infantry must be helped by great care in the fire preparation and great precision in the barrage, with the least possible dispersion, and not by sanguinary losses in their own ranks.

There is, evidently, one critical moment, namely, when the barrage leaves the enemy's trenches to advance farther, for at that moment the fighting line is still some one hundred or one hundred and thirty yards from the trench. If the defenders perceive that the barrage has passed

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on, they can run quickly to their fighting stations. But after the terrible bombardment to which they have been subjected, the defenders are generally in a dazed condition and find it hard to determine the precise moment when the barrage left them. The fighting line should, at that moment, mend its pace, so as to reach the trench as soon as possible; it does not take long to cover one hundred or one hundred and thirty yards. Moreover, the two first lines shower the trench with hand or rifle grenades before getting there. They cross it without stopping, while the trench-cleaners take charge of the remaining occupants.

The liaison between the infantry and the artillery is, essentially, a question of time-schedule. It is determined for each minute by the plan of action drawn up before the attack. The general of division must arrange to halt the progress of the fighting line from time to time, so that the infantrymen may take breath and re-form, thus maintaining the desired cohesion; the barrage must likewise halt during these intervals.

Liaison by time-schedule has one drawback; for, if the fighting line is halted, partially or completely, and the barrage continues to advance, the infantry will be without artillery support. There must, therefore, be established a system of signalling from fighting line to artillery. The signals, which should be prescribed by the

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General-in-Chief, are three in number. The first calls for lifting the barrage, as, for instance, when it is not wise to let it remain on a certain line during the entire time agreed upon; the second calls for holding the barrage in place beyond the allotted period; and the third, for an increase in intensity, as when, for instance, unexpected difficulties have held up the advance. It is never safe to ask that the barrage be brought back, owing to the dangers to which advanced elements might be exposed by this proceeding; the artillery might mow down their own infantry, and some of the bravest of them at that.

The aircraft participate in the attack from the start. Some of them continue to adjust the artillery fire, others watch the enemy's movements, and still others accompany the infantry troops and keep the Command informed as to their progress or their difficulties.

Difficulties at the start, such as the existence of nests of machine guns not destroyed by the artillery preparation, can be overcome by means of tanks (assaulting artillery). Tanks meet the infantry's need for accompanying cannon to overcome obstacles in the way.

It was formerly held that when the moment came, the trench artillery could accompany the infantry. In 1915 I was ordered to make use, during my progress through the Labyrinth, of

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some old mortars which had been left in the departure trench, but they could not be moved. Similarly on the Somme in 1916, the 58-mm. mortars were supposed to follow the troops, but neither they nor their ammunition could be carried very far across the terrain where the attack was in progress. For a long time afterwards I saw 58-mm. bombs left lying around in the boyaux or here and there in the fields, because the men detailed to transport them had been killed or wounded, or just discouraged by the difficulties of transport. In consequence, at the time of the attack on the Aisne in April and May, 1917, my comrade Hauet, trench artillery commander for the Sixth Army, made up his mind to leave the 58-mm. pieces in place and to use the trench artillerymen as porters and supply men during the attack; at the same time a large number of mules and carts, which had been used for transporting ammunition for these pieces for the preparation, could be utilized for forwarding supplies.

Trench cannon could not accompany the fighting line on account of their weight; machine guns and 37-mm. cannon are more easily moved, but even they could not go forward with the troops without risking almost certain destruction. It was logical, therefore, to provide these pieces with protective armor, and next to make

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them self-transporting; the outcome was the tank.

The mobility of a tank depends upon the sort of cannon which it contains. It can play either the part of real accompanying cannon if it carries 75-mm. cannon, or that of armored 37's and machine guns. Its invulnerability to rifle bullets and shrapnel enables it to go right up to nests of resistance and overthrow them. It can beat down accessory defences not sufficiently destroyed by the artillery, — for instance, those on a reverse slope, — and open a wide path for the infantry's progress. Finally, a light tank can be used as a command post for the leader of an attacking unit, and thus permit him to direct the advance of his troops. This task would be more difficult to accomplish under fire if this leader were in an observation post, which is sure to be a target for the enemy's artillery.

The tanks should precede or accompany the first wave of infantry. If they precede it, they can replace the artillery in the task of destroying the enemy's first defences, thus facilitating surprise; they can even replace the moving barrage and assume its functions. The infantry can follow in their track as far as the first enemy trenches. A nest of machine guns against which the artillery can no longer fire must be destroyed

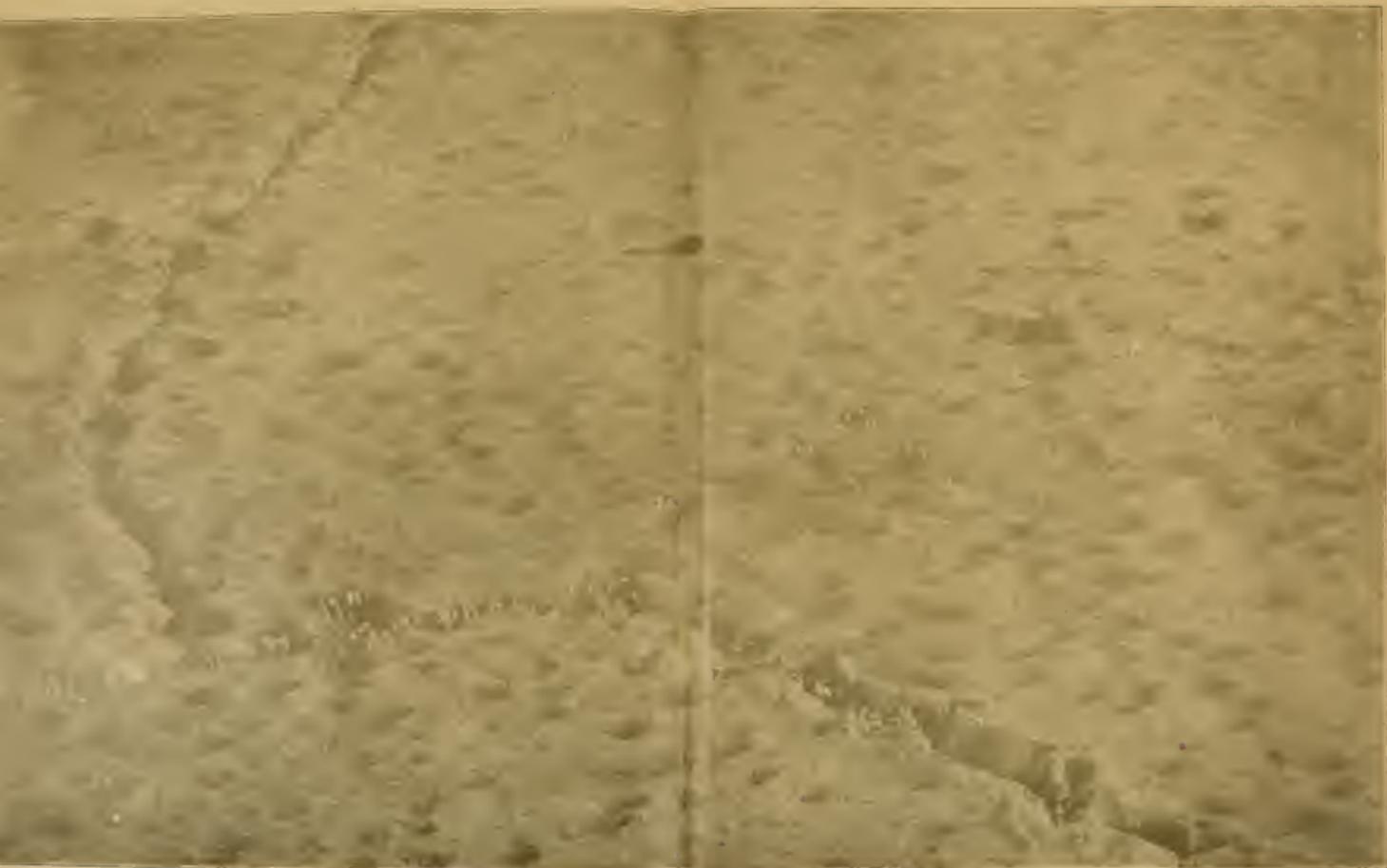
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by tanks, not by grenades, still less by bayonets. In order that they may not be liable to sudden assaults by groups of infantry, they must order their progress in such a way that each may always be flanked by the other's fire.

The rifle grenade and hand grenade are the principal weapons of the infantry during the first phase of the attack. The enemy is in his holes, where he can be reached only by high trajectory weapons. Of course he may be encountered in the boyaux and spitted with the bayonet, but this performance should not be glorified into a sort of cruel sport. Moreover, the sport may become cruel for the participants if they take a notion to try to capture a nest of machine guns. A few men may reach the objective and take it, but how many will remain dead on the field, while the same result could have been accomplished without loss by using artillery, or a tank, or even a 37! In war we should consider, not the artistic appearance of a success, but its cost in human life.

The rifle is of very little use in the first phase of combat; the automatic machine rifle may be of some use in spraying a trench or boyau.

With regard to other means, clouds of smoke may serve to hide the advance of the attacking waves from the enemy; clouds of gas may force him to put on his gas mask, which diminishes



THE COMBATANTS IN THE DEMOLISHED TRENCHES AND SHELL-HOLES
Photograph of the attack of October 10, 1916, taken from an airplane. The "Guillaume trench"

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his capacity for resistance; they may even cause him distress and loss. Still, gas is a two-edged weapon, and may, in case of a change of wind or a rapid advance, play havoc with the side that has used it. Streams of liquid fire may, under certain circumstances, promote the advance of the infantry, by forcing the adversary to burrow into the earth, to retreat, or to surrender.

When an attack has been well prepared, its initial phase, which consists in seizing the enemy's first trenches, should take place almost without loss. On the Somme in 1916 certain battalions sustained losses which were well-nigh negligible, but they did not fail to capture the objectives assigned to them.

. . .

The struggle in the interior of the position constitutes the second phase. It takes a different form and presents greater difficulties. The enemy is no longer in a system of trenches which are familiar to the assailant through long study; he is scattered about in the remains of boyaux, in shell craters, and in unsuspected or newly constructed trenches; he no longer offers a good target to the artillery. Isolated resisting groups will be found here and there, taking the advancing troops in enfilade. Trenches suddenly

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reveal themselves on reverse slopes, protected by accessory defences which the artillery has been unable to destroy. The tanks are too slow and clumsy to follow. The artillery will be obliged to move forward in order to be within effective range, and so must create new emplacements and observing stations. The work of destruction will be found less complete.

The distinguishing characteristics of this phase were well observed at the battle of the Somme in 1916. Certain officers, instead of noticing that a new phase of the attack had opened, announced: "The tactics of the war have changed again; there are no longer continuous trenches, only organized shell craters; we must forget all that we have learned." When the day comes that we see the pursuit, the march of approach, and the rapid attack on a position of inferior organization, we shall hear once more that tactics have reached an unforeseen stage; really it will be the logical development of the combat.

The struggle in the interior of the position is carried out only by the first wave or fighting line. The following waves join in to help at the proper moment, to repel counter-attacks and hostile manœuvres; their rôle consists in insuring the continuity of the attack and the retention of the conquered terrain.

The fighting wave is not actually arranged in



PHOTOGRAPH TAKEN FROM AN AIRPLANE AT THE ATTACK OF OCTOBER 10, 1916, AT BOIS HART

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the regular and rectilinear fashion prescribed in the books. After a short period of combat it is generally useless to look for the intervals between the three lines, or the locations of the specialists; often it is futile to look even for small organized units such as companies or sections. The men are divided into groups, seldom larger than half-platoons, and they advance with the help of such accidental protection as they may find, such as boyaux, shell craters, sunken roads, ditches, etc.

It is difficult for the commanders of various units to follow the accidents of the combat; yet it is essential that they should do so if they are to give orders to their subordinates and to transmit information, each to his immediate superior. Consequently the system of liaison must be in perfect working order during this phase of the combat.

Observation from the ground continues to be of great importance. The commander of a unit should choose a new observation post each time he advances, and place his command post in the near vicinity. Observing stations for information and for the artillery should be established during the course of the advance in convenient spots; they must enable the observers to follow the progress of the combat and the signals of the attacking line.

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Aerial observation is even more important than observation from the ground, from the point of view of liaison. The accompanying planes should never lose sight of the infantry line; they must keep in communication with it and watch the opposing troops. The Command planes should watch the enemy in specified sectors, and keep the Command informed as to his situation, his concentrations, and his movements. Finally, messenger planes must maintain liaison between the Command and the troops, carrying orders and information. Balloons perform similar duties, never neglecting, however, their function of adjusting the artillery fire: infantry balloons watch the line of attack and transmit its signals; Command balloons follow the progress of the attack, so as to keep the Command fully informed.

Liaison is maintained between the troops and the aircraft by divers means. The attacking line shows its position to the accompanying planes by means of Bengal lights, or pieces of cloth called "marking panels" (*panneaux de jalonnement*) stretched out on the ground, or by flashlights or mirrors, or other means. The signals are made from lines agreed upon in advance, or at the request of the airplanes, or on the initiative of the company commanders; all other troops besides those of the attacking line must be for-

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bidden to make signals for fear of confusion. Behind the line the command posts for battalions, regiments, and larger units signal to the airplanes and balloons; they use special pieces of cloth, called "identification panels," stretching them on the ground to show their situation; they also use panels or flashlights to send messages.

The accompanying planes fly as low as possible in order to be in touch with the infantry; they identify themselves by acoustic or cartridge signals. They communicate with the infantry by cartridge signals, receive the return signals, and take note of the location of the troops. They send urgent information to the Command by means of wireless; other matter is sent by weighted messages which often consist in sketches prepared in advance and filled in with the information obtained.

Balloons are used for liaison in the same way. There is usually one balloon for each infantry division. It receives messages from the attacking line and the command posts. In order to address a post, it first gives the call signal (*indicative*) of the point with which it wishes to communicate, and then makes one of the very simple signals, such as "Understood," or, "Repeat." It sends information received to the ground by telephone; this, in turn, is trans-

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mitted to its proper destination by telephone, or, if need be, by wireless.

It is essential that the signals should be the same throughout all the armies on the same front; in this matter, as in all others, coördination is one of the essential conditions of success. Let us, therefore, hope that the same signals will be used, not only by all the armies of one nation, but by those of all the allied nations fighting on one front.

During the struggle in the interior of the position, telephone lines must follow the troops as closely as possible. Furthermore, it is necessary to plan in advance just how the system must be constituted, and to put it into operation without delay.

As long as the artillery can progressively lengthen its range according to the time-schedule settled by the plan of action, it continues to deliver a barrage fire. There comes a moment, however, when it is obliged to break up into elements, as is the case with the infantry likewise, for fear of inflicting losses upon the elements which are advancing in ragged formation, or of hindering the progress of those elements which have been most fortunate or most audacious.

The artillery has, in fact, two important duties, besides lending the help of a moving

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barrage; first, it should destroy or neutralize those of the enemy batteries which have been unmasked; second, it should constantly protect the fighting line against counter-movements on the part of the enemy.

The destruction or neutralization of the enemy's batteries is entrusted to special groups of artillery called "counter-batteries." The list and plan of the enemy's observing stations and battery emplacements is always kept up to date. If it happens that in spite of the precision and the continuous methodical execution of the fire, in spite of the amount of ammunition expended, it has still proved impossible to destroy the enemy's batteries during the period of preparation, then they must be neutralized during the struggle in the interior of the position. This operation consists in silencing them during the period when the infantry is advancing. It is effected by firing at top speed and sending gas shells when the atmospheric conditions are favorable. This will enable the infantry to advance and sometimes even to go right up to the silenced batteries. This fire must be carried out according to a methodical plan and by the efforts of all the batteries designated for the purpose.

The constant protection of the fighting line against hostile counter-movements is the duty of other groups of batteries. These must fire on

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all counter-attacks and isolate the fighting zone by shielding its immediate surroundings, and the more remote roads and tracks leading to it. If, during the course of the attack, any point becomes particularly important, these batteries must concentrate their fire thereon; concentrated shell fire is to-day thrown into the combat at one point or another, just as formerly reserves of infantry were thrown in.

In order that the artillery may fulfil its function of directly supporting and constantly protecting the infantry, the liaison between the infantry and the artillery must be of the closest possible nature. To this end the artillery should always detail liaison agents to follow the infantry. Thus, each artillery battalion should have a liaison and observation group detailed to the infantry unit which it must support directly. The leader of this group informs the artillery battalion commander as to the situation and needs of the infantry, and tells the commander of the infantry unit what support he may expect from the artillery.

The artillery must be constantly informed of the exact geographical position of the infantry, its tactical situation, its intentions, and its needs. This information will also come to the artillery through the Command, but its own liaison system will duplicate that through the Command,

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and prevent delays. In fact, rapidity in transmitting information may be of the highest importance, whether it be a question of firing on a counter-attack or concentrations of the enemy's troops, or lifting the fire to permit the infantry to advance, or even, perhaps, to rectify a mistake. For this reason various means of communication are employed: rockets and visible signals have the advantage of being instantaneous; messages sent by hand or telephone are less rapid, but more explicit, though not always practicable.

The liaison between the infantry and the artillery does not imply that the infantry commander may call at will for the fire of those batteries with which he is in connection. Even the artillery battalion commander can take such an initiative only when the case is urgent and the objective shifting, — for instance, in case of a counter-attack, a concentration or movement of the enemy's troops; he must, furthermore, report his action immediately to his superiors. The artillery troops must be at the disposal of the division commander, assisted by the artillery commander, in order that they may be utilized for the greatest general good.

The division commander obtains much of his information from airplanes and balloons. These machines communicate with the information

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centre by means of flashlights, rockets, and weighted messages. The information centre is in the near vicinity of the command post of the general commanding the division, and follows his movements; it is connected directly with the landing-field for the airplanes. This general arranges and alters the grouping of his batteries in accordance with the information he receives; he may put a certain number of them at the disposal of the officer in command of his infantry, or of his colonels.

While the infantry is advancing in the interior of the position, the artillery keeps up its fire against the enemy's batteries and against his troops and organized defensive works. To this end it should be moved forward in successive echelons in such wise that a sufficient number of pieces are always in battery. This displacement, which temporarily puts some of the pieces out of action, should be planned beforehand in the most careful and methodical manner. New emplacements will have been arranged for as far as the departure trench, but, beyond that, everything has to be improvised in the briefest possible time. In displacement speed is of the highest importance, because the infantry cannot venture beyond the protection of its artillery without exposing itself to the cruellest of ordeals. Thus the advance of the infantry depends not alone on

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the ease of the terrain which it has to cross, but even more on the readiness with which the heavy artillery can be displaced. Special gangs of workmen must be trained and kept in readiness in order to carry out this displacement speedily. The new observing stations and emplacements must be picked out beforehand by the liaison and observation details which advance with the infantry.

The displacement of cannon and of observing stations is a dangerous procedure, and should be carried out, whenever possible, during the night. Still, as it cannot be dispensed with if the infantry is to advance, the move sometimes has to be made by day. The artilleryman must expose his life fearlessly when it is a question of saving the lives of others.

During the first years of the war, the authorities were not sufficiently well aware of the necessity for artillery to give support to the infantry. Let me tell the story of one of those who clearly saw this necessity, which is to-day so well recognized, and who bravely gave his life for the faith that was in him. My stepfather, Honoré de Villard, had reëntered the service at the beginning of the war as major of artillery. He had studied and outlined, as early as March, 1915, a system of liaison permitting the airplanes to adjust the artillery fire, but what occupied his thoughts especially, as he wrote to me April 13,

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1915, was the "fire liaison" between the infantry and the artillery, during the period of stationary fighting as well as during the attack. He had drawn up a report on the subject, but dared not count on its producing an impression, owing to the fact that the different arms of the service refused to recognize their interdependence.

In the month of September, 1915, he was in Champagne, where the great autumn offensive was in preparation. In all of his letters he spoke to me of the liaison between the artillery and the infantry.

On the 3d of September, he wrote, describing the work of preparation: —

"Here we are, for the last six days, almost out of communication with the outside world, in a cold drizzle, but in the feverish activity of a great preparation. Some people are moving about beams and joists and earth, others are fiddling with the coördinates on the battle map, others are trying to pierce the veil of the enemy's wire entanglements. Each is working heartily, although the supply service leaves a little to be desired. I am tending my liaisons with the infantry; let us hope that there will be no slip-up in that direction."

On the 11th of September he let me infer from the grave tone and precise detail of his letter that the day for the attack was drawing near: —

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“During the forthcoming attack my battle command post will be in the first-line trenches. As soon as the infantry has set foot in the German trenches, I shall go to those trenches and choose another observation post, from which I can watch the farthest zone that our infantry must cross. This infantry is to advance behind a curtain of fire which must stretch before it. You see that my task is delicate. If I come back safe and sound, I shall have had a good run of luck. Do not think that I am being intentionally imprudent; there simply is no other place where I can do my duty. I am no dare-devil. I am anxious that if anything happens to me, I shall not bear that reputation. I am merely trying to get the best results with my fire, and to that end *I must* be on the spot and nowhere else.”

The attack took place September 23. On the 1st of October I received one of the postal cards which those who are going to the attack write to their nearest and dearest: —

“Two hours before the attack. I send you all a greeting from the bottom of my heart. I hope soon to send you news. If not, write to Major Bordeaux, Sector 43. To all of you most, most affectionately . . .”

I received the card October 1. The next day a letter came from Major Bordeaux, his friend of many years' standing: —

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“Dear Paul: It’s awful. Honoré was killed this morning with the first assaulting wave.”

Little by little I obtained the details of his death. When the infantry had reached the first German trench, he went there to choose an observation post from which he could train his batteries on the next nest of machine guns which might halt their progress. Since, however, this new post was not arranged for observation, he was obliged to raise his head above the parapet, and received a bullet in the neck which killed him outright.

The sacrifice of a man of his age and worth showed his juniors the way that duty lay; since then many others have given their lives in trying to spare those of the infantry, or in trying to open for them a road to victory. We should not weep for those who die thus, but rather envy their chance to do so much for the mother country of them all.

By dint of the help of the artillery, the infantry can continue its advance into the interior of the position. If a part of the fighting line is halted by a point of resistance, the adjacent parts continue their advance, outflank the point, cut its communications, and force the defenders to surrender.

There are still cases where manœuvring is difficult and artillery support impossible. The



AN ENGLISH TANK, AT THE BATTLE OF THE SOMME IN 1916, HALTED AND IN DIFFICULTIES, BETWEEN LEUZE WOOD AND COMBLES



BATTLE OF THE SOMME IN 1916
Capture of the village of Combles: a house on the west side of it

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infantry must then overcome the obstacle by its own resources. This case, which may sometimes occur in the initial stage of the attack, is quite common in the struggle in the interior of the position. One of the most dangerous obstacles is a trench on a reverse slope. The fighting line reaches the zone which is taken under the fire of such a trench without being forewarned. If it seeks to advance farther, it hurls itself against accessory defences, which are still intact, without any means of destroying them. Thus, in the battle of the Somme in 1916, after their initial success, the units of the Twentieth Corps found themselves beyond Hardecourt confronted by a sunken road on a reverse slope which held them up for days. They suffered considerable losses, and imagined that they were opposite a strongly organized work, when really there was nothing but a few inches dug in haste. The enemy's field of fire was eighty to one hundred yards at most, but it was enough. They were only enabled to put an end to the business when the artillery could advance on the adjoining sector, and take the sunken road in enfilade.

The infantry cannot demand a complete sweeping of the terrain by the artillery, for that is impossible. It should be able by its own efforts to overcome such obstacles as reverse-slope trenches and nests of machine guns. But

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how? It cannot count on the portable arms of flat trajectory, such as rifles, automatic machine rifles, and machine guns; it is useless to think of the bayonet; hand and rifle grenades can be of service only if the enemy's works are under the open sky; a 37-mm. cannon might reduce the obstacles, especially with an explosive shell; but this weapon is neither sufficiently well protected nor sufficiently powerful.

At the present moment there is nothing but the tank which seems to unite all the qualities necessary to replace the artillery in giving real help to the infantry; that is, if it is armed with such a weapon as a 75.

Can the tank advance easily through the position? The nub of the whole matter is just there. On the Somme in 1916 I saw some English tanks in a sad state, abandoned on the slopes down which they had started to charge. Apparently in the last attacks of 1917 the English and French tanks worked wonders.

The tank must keep in constant touch with the infantry, the artillery, and the aviation, if it is to overcome every obstacle. The infantry, which it helped in the beginning, can now give it great aid in return by clearing and preparing the terrain before it. Details of men hurriedly fill up, with earth or fascines or material of any sort, wide ditches or shell craters which might stop it.

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Turn and turn about, the tanks open a road for the infantry, and the infantry for the tanks. The airplanes fulfil their functions of accompaniment and surveillance, and even their fire-adjusting functions, by pointing out instantly any batteries which might shell the tanks, and adjusting the fire on them.

So regarded, the tank is really an armored infantry cannon which, if its means of locomotion permit it to travel far enough, becomes an accompanying cannon for overcoming obstacles. It can never replace heavy artillery, which is indispensable for overcoming modern defences, but it can fulfil two functions: it can replace the preparatory fire on the accessory defences, thus making possible a surprise attack; it can destroy points of resistance encountered on the way, so that the infantry can advance into the interior of the position with a minimum of loss.

The infantry suffers heavily in the thousand little combats of the groups which compose it. The fighting line cannot advance indefinitely without its units getting into bad shape. It is never wise to use up a body of troops to such an extent that it can never be reconstituted. For this reason relieving units must be introduced during the course of the struggle. This relief is effected by sending the rearmost unit forward; the units already engaged come to a halt at a

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fixed moment and the relieving units pass them, picking up useful information as they go by. The attack is continued by fresh troops, while the troops relieved are successively passed by those behind them, until at last they find themselves in the rear, and become reserves.

The advance of the units in a specified direction is not always easy on account of lack of landmarks in a country that is devastated, swept bare, and shorn of features easily recognized before the battle. The fact that the troops must hide themselves as much as possible from the enemy's observation and from his batteries makes it difficult to keep a fixed direction. The darkening of the atmosphere by shell explosions and by dust renders the situation still more difficult. For this reason the pocket compass should be brought into general use. All officers, platoon and half-platoon leaders, and, in fact, if possible, all N.C.O.'s, should carry compasses, and know how to use them. This precaution will save hesitation and delay in the march of the units.

During the advance of the fighting line, the reserves continually move forward. They are not idle, even when they are stationary for a certain time, because they take part in organizing the conquered terrain.

The engineers help in that part of the work

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which calls for their special technical knowledge and give their advice at whatever point it is needed; they are distributed by the Command in such a way as to be most useful.

Fighting during the night is the natural continuation of that during the day, but does not have the same characteristics; it can, in fact, merely serve to consolidate results already obtained. Night is the time when works can be undertaken without too much danger and relief or supply executed most easily.

Work must be carried out by night as well as by day, even in case of bombardment; for at night one can begin work on a boyau or trench over a large space of ground and make enough shelter so that the operation may be continued by day. Rapidity in constructing defensive works saves many lives and helps greatly toward retaining the conquered terrain.

The advance can sometimes be continued during the night if the troops are perfectly familiar with the ground, or if the enemy is completely demoralized; in any other case they run serious risks of falling into murderous ambushes or making costly mistakes. Liaisons must be maintained and made certain, each move of one unit being communicated to the units adjoining.

The only operations usually possible during

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the night are local raids intended to seize such objectives as a favorably situated observation post or a useful trench, to overcome a point of resistance or capture an important post, in order to prepare for the advance of the morrow. Such raids are, naturally, carried out without the help of artillery, and depend for their success on two principal factors: surprise, if the raid has been well prepared and skilfully executed, and the weakness of the enemy's defensive works which may well have been hurriedly constructed. One must get such information as one can, and carry out these raids at the moment when the enemy is executing a relief or is busy strengthening his defences. The troops involved generally go lightly armed, without gun or bayonet, in order to secure greater freedom of movement, and more complete silence. They approach as close as possible to their objective, then fall upon it with grenade, revolver, and knife.

Watchfulness must not be relaxed during the night. It is important to gather all possible information that may be of use in resuming the advance the next day. Active surveillance will often show that it is possible to occupy points temporarily stripped of their defenders, or to follow the enemy in case he tries to free himself by a retrograde movement.

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Artillery can offer no assistance to night operations; at most it can deliver a barrage at ranges worked out before nightfall. Heavy artillery can pour a disturbing fire on certain much-used lines of passage, cross-roads, and other important points. Night is also the natural time to deplace the artillery, to construct new observing stations, emplacements, or telephone connections.

The airplanes and dirigible balloons take advantage of the night, and set out to bomb important railway *dépôts* and railroads, cantonments and bivouacs of reserves, warehouses, factories, and parks of artillery situated behind the enemy's fighting line.

The night is often used to supply the fighting line with men or food or ammunition, and to remove the wounded and all sorts of matériel. These operations behind the first-line troops give rise to an immense movement behind the whole of the fighting forces because of the large numbers of effectives involved; they are carried on both by day and night.

The bringing-up of reserves, munitions, and food, as well as the work of evacuation, constitutes one of the most important cares of the Command during the whole period of the attack. There can be no continuity of forward movement where there is no continuity of supply and evacuation. If the reserves do not arrive at the

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right moment, if ammunition is exhausted even momentarily, if food is lacking, success is compromised.

The sending-up of reserves when they are needed depends, above all, upon the completeness with which the Command is informed of the situation. To this end the system of liaison must be well established, and reports must be frequent and clear. Success will also depend upon the manner in which orders are given to the reserves, and upon the organization, condition, and maintenance of the roads leading to the Front. The officers who draw up the time-schedule must have very definite knowledge of the rate of progress of troops in the boyau or across difficult country, and the roads to be followed must be free from all obstacles. Finally, the reserves must have guides able to lead them day and night, and to acquaint them with their position at any moment.

The supplies of food and ammunition are forwarded by means of railroads and highways in the rear, and by narrow-gauge lines toward the Front. Success in forwarding supplies will depend upon a careful preparation as far as the departure position is concerned, and for the rest of the route, upon the rapidity and success of the work of aménagement in the conquered terrain.

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The removal of the wounded, of prisoners, and of matériel, is carried out as soon as possible by means of boyaux, roads, and railway lines especially reserved for the purpose. Success in these operations depends almost entirely upon thoroughness of preparation.

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The organization of the conquered terrain is the last phase of the attack. It starts at the same time as the attack, and continues as long as it is in progress. A general scheme, drawn up by the Command, must govern all the works and lay down the order of urgency. To leave the small units to their own initiative would effect nothing but a waste of time and effort.

To begin with, the first-line trench must be joined to the first of the conquered trenches by means of boyaux; beyond that, the enemy's old boyaux may be used. Then the successive trenches must be put in order, repaired, and reversed, constituting new lines of resistance in case of a *retour offensif* on the part of the enemy. The only exception to these rules occurs when the advance covers a considerable depth of territory in a short time; in this case, the first thing is to organize the terrain which the fighting line has reached. Moreover, it is just here that there will be a lack of works which can be of use to a further

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advance, in case the attack develops successfully; they must be constructed.

All the rules for organizing a position apply to one that has been captured. The first parts to be put into condition for defence are those against which a *retour offensif* might be directed. Detachments of engineers must be placed at the disposition of the commanders of sectors and sub-sectors to help this work of organization. The Command must immediately draw up a plan of the works.

One essential principle must ever be borne in mind. A position once captured must never be lost. This is not all. A conquered position represents a step in advance toward the enemy, its capture is a prelude to breaking the Front. One idea must ever be present to the Commander who captured it: "Can I take the next position?"

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I have tried to describe, with as few technical terms as possible, all the measures to be taken in the course of an attack. The difficulties of the enterprise are evident.

An attack should never be undertaken without a fixed determination to carry it through to complete success; that is to say, to capture the opposing position and the positions beyond, and to

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strike the enemy. Under any other conditions an attack is nothing but an unpardonable waste of men, of energy, and of matériel.

Of course an attack on a limited front, with limited effectives, will cause the enemy loss. Generally, however, the amount of attrition effected is out of proportion to the effort expended. Moreover, such attacks produce reaction, especially when they succeed, so that they tend to create centres of perpetual conflict which must be supplied with men, although perhaps in zones where this is highly undesirable.

These local attacks are really useful only when they yield important observing stations; under those circumstances they are really advantageous and accelerate the rate of attrition.

An attack should succeed from the start, and be continued without pause until the opposing position has been completely conquered. If the enemy is able to re-form in the interior of the position, he will have an excellent chance of stopping the attack; his position will merely have a new contour. In this case the attack has failed; it is useless to attempt to advance farther without a new preparation. To do so would entail a futile sacrifice of lives.

This mistake has been committed many times in the course of the present war. An attack would succeed at first; then it would be halted

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for one reason or another: the reserves did not come up, the objectives aimed at were too restricted, the Command was frightened by the losses which had been suffered. Thereupon the enemy would entrench rapidly and carry out *retours offensifs*, supported by artillery, which would rivet the attacking troops to the spot where they were.

Success at the beginning of an attack depends almost entirely upon the preparation. Complete success also depends thereon in many respects, owing to the vital importance of the work of supply. Yet much lies in the hands of the leaders of the small units of infantry who carry on the combat in the interior of the position, and on the leaders of units of the other arms who lend their support and aid. In this great drama, each actor must play his part with sure knowledge and boundless devotion, and must always know how to make his personal activity fit into the total scheme and contribute to the total result. Finally, much lies in the hands of the commander, who must know how to make a judicious use of all the forces at his disposal; he must know how to bring into play the full powers of his troops, how to spare them wisely, to meet all their needs, and to coördinate all their efforts.

VI

HOW TO ACHIEVE VICTORY

LECTURE OF NOVEMBER 19, 1917

SUMMARY

The general principles which determine success are the same in war as in business. — Coördination at four successive stages: among the Allied nations (superior council); among their armies (generalissimo); between the arms and the services of an army; between the specialists of an arm or a service. — Coördination among the Allied nations. — Rôle of each of the nations: France, England, the United States, Italy, etc. — The pooling of resources. — Coördination among the Allied armies: rôle of the generalissimo. — Tactical coördination.

Tactical principles. — How to destroy the enemy's army. — Breach of the Front sought by attrition. — The choice of zones of attack is the whole of modern strategy. — Simultaneous attacks. — The principal attack chosen by the generalissimo according to the results. — Pursuit and march of approach. — The absence of positions marks the end of the war. — Justification of this theory. — How the victorious army advances.

Study of the two phases which will occur when victory is won: pursuit and march of approach. — Pursuit: rapidity; continuity; liaison. — Troops entrusted with the pursuit: cavalry; light motor artillery; infantry; artillery; aircraft; engineers. — Formation of march; use of the specialists. — Displacement and supplying of the artillery. — Sudden attacks. — March of approach: study of the position; formations to be adopted; rôle of the different arms.

Necessity of strengthening the ties between the Allied nations. — Deeds, not words. — Keeping up of the morale. — Victory by arms.

WE must have victory. But how are we going to get it?

Far be it from me to tell you that I have any infallible recipe, or to criticize the generals who are in command of the Allied armies. I do not

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wish to be counted as one of the armchair strategists who lean over the war maps, place their fingers on this or that point, and say: "If I were Marshal Joffre . . ." or, "If I were General Pétain . . ." They thereupon explain their strategical plans, turn the enemy's flank in a short time, and win a decisive battle, after which they proudly wait for some one to say: "Why has no one ever thought of putting you at the head of the armies, instead of Marshal Joffre or General Pétain?" These undiscovered Napoleons are numerous; every one must have met them. The only reply is that if victory were so easy, Marshal Joffre or General Pétain would doubtless have achieved it ere now.

No, indeed, victory is not easy. Yet, if it is not possible to trace the exact road which the future victorious armies must follow, it is still possible to exhibit the simple general principles which will open that road to them.

The principles which bring success in war are, in large measure, the same as those which bring success in business. For that reason the Americans will be the first to grasp them. War is an enterprise, and a very big enterprise to be carried through successfully. There must, consequently, be a board of directors, and at the head of that board a chairman who sees to it that the wishes of the board are carried out.

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What would happen to an industrial organization if the workmen went ahead without the advice of the technicians, if those who made machines did not bother about the needs of manufacture, if the sales department paid no heed to the wants of the public, if the treasurer ran up expenses in ignorance of the revenue? What would happen even if in one branch of the enterprise all the employees were not working towards the same end? The whole thing would go to smash.

It is the same in war. The Governments of all the Allied nations should establish a perfect co-ordination with one another. In the same way the head generals of the armies of each of the Governments should be under a single generalissimo. In each particular army the different fighting arms and the different services should act in perfect harmony. Finally, in each arm the specialists should work together harmoniously. Thus, at four successive stages — and at this last one more insistently than ever — crops up the word to which I attach an almost magical power — coördination.

Germany established coördination with her allies by forcing her will upon them. She has pooled all of their resources and used them to her own advantage. The Allied nations, jealous of their individuality, proud of their past, and care-

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ful of their self-esteem, have merely been business partners; they have never been fused into one homogeneous whole. We are free peoples, and none of us will permit even the suggestion of subjugation to another. For this reason we have not sufficiently understood the value of coördinated effort under one supreme control and the proper utilization of all the forces at our disposal. The fact is that we are all in the same boat, and each should be given his special individual task in the common effort.

France, for the last three years, has borne nearly the whole burden of the war. She is not yet exhausted, she still has millions of soldiers under arms, from boys just out of school to middle-aged men with grey hair. Little by little she is spending the savings accumulated through many years by her hard-working people. She will keep on fighting. At the present moment she has a great army in Greece, and she is sending many troops to Italy, while she holds in an iron grip the greater part of the Western Front. But there is a limit to the efforts which any true friend can ask her to make. One asset she has which her Allies can count on — experience. Among the officers who have survived the terrible battles of the last three years, there are many who have a right to give advice to the new armies. These armies need feel no false pride

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about receiving such advice; experience bought at the price of so many lives has an incalculable value.

England is fortunate in the numbers of her soldiers, which have not yet been sensibly diminished by losses, heavy as these have been. Her army, put on a war footing and trained by an enormous effort, has reached great proportions. It is able to constitute to-day the driving mass on the Western Front. England has also the resources which come from her great industrial and commercial situation and her vast territorial possessions. She can go into battle with well-trained and well-supplied troops.

America, coming late into the war, has, during the first two years, reaped considerable advantages and augmented the national wealth. She has money, which constitutes, according to an old proverb, the sinews of war. She has other forms of wealth, food, metals, coal, etc., and if she is wise enough not to waste these precious possessions, she can help largely towards achieving victory. Moreover, she has many men. It may well be her army which will make the balance tip definitely towards victory for right and justice. To that end the American army must be trained, and trained quickly, for the dénouement of the war is approaching rapidly. Germany is trying to eliminate each of her adversaries in

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turn by overwhelming it with all the forces of the Central Powers. America must take part before this design is accomplished; she must not find herself alone, surrounded by exhausted allies. It is for this reason that it is so necessary to give a proper direction to the training of the American army, to avoid half measures which may delay for several months or perhaps years the entrance of American troops into the battle line. I am anxious also to spare them the sacrifice which the other Allies have known, of hundreds of thousands of their men, needlessly slaughtered for lack of preliminary training. Without tiring, without discouragement, I shall insist upon the importance of training.

Italy, up to the present moment, has held fairly large numbers of the enemy's troops upon her borders and has, in this way, rendered important service to the common cause. At this moment she is passing through a period of trial the end of which, nevertheless, we may soon hope to see. The Allies, face to face with events of such gravity, are at last putting the principle of coördination into practice. Italy herself is learning at the cannon's mouth the experience of the Franco-British armies, and is organizing positions echeloned in depth. She may continue to fulfil her defensive rôle, she may even, at the opportune moment, change to an offensive which,

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thanks to the "furia" of her enthusiastic troops, will yield back the conquered territory, and more besides.

Russia had a noble record during the first months of the war. She may still be of use if she manages to find herself. We must hope that she will be able to purge herself of the preachers of anarchy and the emissaries of the German espionage. If she does this, she should be able, without great effort, to hold on her frontier a considerable fraction of the forces of the Central Empires. Japan, Rumania, Montenegro, Serbia, Greece, Portugal, and the others can collaborate, each in accordance with its resources.

In this vast association of peoples, united for the triumph of liberty, all resources must be held in common and used for the greatest general good. A system of loans and exchanges must be established under advantageous conditions, as between friends, so that each associate shall be exposed to a minimum of suffering and want, and shall have a maximum of means to fulfil his special task. To this end it seems that we should have a superior Inter-Allied Council to examine and pass upon important questions. Already some governments, as those of France and Great Britain, have deliberately entered on this path. Let us hope that the plan will spread. Born during the travail of war, such an understanding

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between governments will be the firmest basis for the future Society of Nations.

The coördination between governments should have, as a corollary, a coördination between their armies. Just as the governments regulate, by means of treaties, all questions of a political or economic nature, so should the commanding generals of their armies draw up a common plan, to be sanctioned by the single generalissimo who is in charge of its execution. This generalissimo, supported by an Inter-Allied staff, should be not only a consulting officer who keeps the Allied governments informed as to the military situation, but also an executive officer in direct charge of military operations. His rôle should be large. He should see to it that effectives and matériel are wisely distributed, that supplies are sent to each Front in due proportion, that general reserves are assigned to such of the Allies as need them; finally, he should definitely indicate to each army its particular mission, without, however, entering into details. Such is the strategic coördination needed to secure the success of our armies.

What about tactical coördination? I have insisted so often upon the necessity for this that I need not return to it now. Based upon adequate preparation, it is effected by an experienced commander. There must exist during each phase

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of the struggle perfect liaison between the various fighting arms, infantry, artillery, aviation, engineers, cavalry, and the different services of a great unit, such as ordnance and supply, sanitation, highways, etc. There must also be proper liaison between the different specialists belonging to the same arm or the same service.

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The great principle of coördination is the prime condition for victory. There are, however, other conditions and principles bearing on the direct conduct of operations and their execution in practice, which are likewise indispensable.

Victory is theoretically won by destroying the enemy's army. In practice this end can never be completely realized. Modern armies have enormous effectives. They are echeloned laterally along an immense front which rests at each end on an impassable barrier. They are echeloned in depth upon successive positions reaching all the way back to where the general reserves are held. The enemy's army can never be struck in its entirety as used to happen in the Greek and Roman and Napoleonic wars. What is possible is to break the Front, or a part of it, by seizing successive positions, and thus obtain, little by little, a collapse of the whole. While the enemy's line is retreating to other positions

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prepared in the rear, the fragments of his army may be attacked in detail, pursued, and defeated, so that he may be unable to re-form.

Thus it appears that, in order to achieve victory, it is necessary to upset the equilibrium at some one point. This is accomplished, in part, by the process of attrition. Each day in the trenches, each local skirmish, hastens the moment of final triumph. The enemy loses men daily, so that daily the numbers of his general reserves grow less. Day by day he has fewer men in the factories; he must use women and prisoners to replace the men taken to fill the gaps in his fighting line. His capacity for resistance on those different fronts which he is obliged to hold diminishes at every point. If the generalissimo of the Allies is sufficiently well informed to pick out the weakest points, he will hurl attacks against them. If he is really successful at a single point, a victory, more or less complete, is assured.

The determination of the points where attacks should be launched, and the choice of the appropriate times to launch them, are the corner-stones of strategy. Strategy, contrary to the usual belief, should be mainly occupied with the choice of zones of attack, and not with the possibilities which might arise after the attack has taken place. Strategic plans for an offensive, and choice

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in advance of the lines of march of armies in regions which they are by no means certain to conquer, are sure to end in costly mistakes. The armies, obsessed with the idea of carrying out a preconceived plan, will insist on trying to overcome insurmountable obstacles, to the neglect of some open space. This would be to repeat, in the domain of strategy, a mistake which has already been often committed in that of tactics during the present war; namely, that of exhausting the troops in an attempt to achieve the impossible, instead of seeking to attain the maximum results with the minimum of effort.

If a general offensive were possible it would be the best means to try out the enemy at every point, to test his powers of resistance, and to find his weak spots. But it would require too many men, too large a supply of matériel, munitions and supplies, and consequently an impossible wealth of raw material of railways, roads, and factories. It is impracticable on account of the enormous length of the Fronts. We must, therefore, be content with partial attacks. On the other hand, we should try to give the enemy the impression of activity on all parts of the Front, in order to keep him in a state of suspense, yet the actual attacks should be launched only in specified zones. Moreover, they should be launched simultaneously, or at intervals of

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a few days, so that the enemy may not know where to send his general reserves, and so that if he does send them to any one point, he will presently feel the necessity of having them at other points also.

The strategy of the Allies has made notable progress in this matter of simultaneity. In the years 1914, '15, and '16 the system of many attacks at once could not be carried out, doubtless owing to insufficient means, especially insufficient artillery. The offensive on the Somme in 1916 was not more than twenty-five miles wide, and was, moreover, isolated. The Germans were able to resist it with an enormous number of divisions, and to replace them in turn till they had completely paralyzed our effort. In 1917, on the other hand, there was a marked simultaneity of attack. On the 15th of August the Canadians attacked at Lens, on the 16th the British and French attacked at Ypres, on the 19th the Italians attacked on the Carso, and on the 20th the French attacked at Verdun. At other parts of the Front, as on the Aisne, or in Moldavia, the struggle already in progress was continued during the same period. This, indeed, is real modern warfare!

It is fair to say that simultaneity of attack does not imply that all attacks need be launched on the same day. In fact, it is often better

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to start the attacks one after another, since modern battles last for weeks, sometimes for months. Under this arrangement the enemy is all the more upset and uncertain. For instance, if he has stripped one zone, and an attack is launched there, excellent results may be obtained.

Suppose that several attacks are started in this way, is it right to decide *a priori* which shall be the principal one, which shall bring victory? Most strategists are of this opinion. They distinguish between the principal attack and the secondary ones. The latter are mere feints, intended to immobilize some of the enemy's troops, or to draw off some of his reserves. But victory, they go on to say, depends upon the success of the principal attack. They expect that the strategic gains from this attack will lead to Berlin or beyond. They draw up elaborate plans for such an advance, sailing gayly beyond the enemy's positions as though they did not exist. In these dreams of victory they overlook one factor, which, nevertheless, has a certain importance,—the enemy. For he is there, and may well take upon himself to bring them back to cold facts, for if the attack fails after a couple of days, our strategists will find themselves a couple of miles from the point of departure, their troops decimated and shot down, before

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positions which they were unable to capture. The whole plan will go up in smoke before the first phase is completed.

Even if the principal attack should succeed, the plan for further advance may be upset at the start by unforeseen factors. If twenty such plans were drawn up instead of one, nevertheless the force of circumstances would render them all valueless. Of course, this is not to say that the commander should not always be looking ahead, but he must base his calculations upon precise information, upon results already attained, not bare hypotheses.

It seems to me that the generalissimo should not designate any one attack as the principal one. Let him choose the zones for attack, — that is the true strategy, the only kind that will avoid disappointment. He should leave to the commanders in charge of the individual attacks the task of foreseeing all possible favorable results which might come from each. He should launch his attacks simultaneously, or at least at intervals of a few days. He may have a personal predisposition towards one attack rather than another, as it may seem to him to promise most rapid or decisive results; he has also a right to foresee its possible consequences. But he must keep his preferences to himself. Each attack commander should feel that he has the fate of

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the country in his hands; each should be provided with the means of following up a success to the utmost limit. In short, it should be possible to convert any attack which succeeds into a decisive one—a general victory.

The real qualities of the generalissimo and of his staff have a chance to show themselves during the days when the attacks are in progress. The generalissimo should be kept informed all the time as to the progress of each individual attack. Here again we see the importance of liaison; the decisions of the generalissimo will be entirely dependent thereon. Success, for one reason or another, may come at that point where it was least expected. It must not be allowed to escape. At this decisive moment the generalissimo, who up till then has played a passive rôle, will come on the scene with all his reserves. He will circumscribe the area and the objectives in those zones where he does not wish to employ large forces, and will give all his attention to that attack which seems to be succeeding. It is then, and not till then, that, as a result of success already attained, this attack becomes the principal one. It is fed from the general reserves, because it is expected decisively to break the enemy's Front and to bring a true victory.

What will happen at this critical moment? The successful attack will have involved the

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capture of a certain number of positions, and a breach will have been opened through which the reserves can begin the pursuit. This pursuit, moreover, will not take place along a single line, but will spread out laterally so as to take adjacent positions in the rear, at the same time that it advances in depth. It will call for a large number of troops.

If the enemy's army re-forms and faces the attackers, it is obliged, in order to protect itself against artillery fire, to occupy a position that has been created already or to create a new one. In order for the advancing troops to reach the enemy, it becomes necessary to attack this new position, and, to that end, to approach it with certain precautions, in certain formations; this is the phase which constitutes the march of approach.

Thus the existence of positions has had the effect of confining strategy within new limits. We cannot to-day make plans for the march of an army, without taking account of the obstacles which it must meet, that is to say, of positions. Little by little some people have come to recognize the existence of positions, or, rather, of a single position. The departure from the position occupied or the capture of the opposing one is, in their minds, merely the prelude to the war of movement, the only kind that is worthy of their

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notice, the only one wherein their genius can find its full scope.

When will people learn that to-day this war of movement can be nothing but the pursuit? Movement is the outward and visible sign of a victory in the war of positions, and this is the only kind of war possible between two armies supplied with modern matériel.

Suppose that there are no more positions, says the objector? Then the war is over. It is impossible to hold the open field against artillery; an army making the attempt would be wiped out. An army wishing to fight must establish a position at the point at which it stops; to guard its flanks it must establish contact with the adjacent elements; in a word, it must reconstitute the Front. When this reconstruction is impossible the fragments of the army will be destroyed in the open country or in the isolated positions where they have taken refuge.

This theory is said to rest on mere hypothesis. Until very recently the accusation had a certain justification, although there is a difference between vague suppositions based on fancy and logical deductions. But recent events in Italy have shown that this theory rests upon solid facts.

The extraordinary thing is that the partisans of the war of movement deduce an argument for

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their theory from these same events; they say: "See, the war of movement has reappeared!" Oh, yes, I see it. I see, according to such information as I possess, that the positions in the rear of those in the front line were either non-existent or unoccupied or badly defended. I see that the pursuit will be finally stopped when the Italian army is established in positions which are sufficiently strong and are provided with artillery. It seems to me that the fundamental principles of the war of positions were imperfectly understood, and that the cause of the retreat, over and above the disintegration of the Italian morale by German propaganda, lies in this fact. I certainly take no special pleasure in justifying my theory by citing these facts, for my heart goes out to my Latin brothers; yet I may not pass the matter over in silence, but rather hope that thus we shall be able to avoid the recurrence of similar mishaps in future. Moreover, I have the firm hope that, thanks to the organization of new positions, the heroism of the Italian troops, and the help of the Franco-British auxiliaries, the present danger will soon be over.

This description of the war of positions, with its four phases, shows that the pretended war of movement, to which some people are still so fondly attached, is nothing but that phase of the combat which is properly called the pursuit.

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But the pursuit, considered in its strategic whole, is quite different from a true war of movement, for the reason that movement therein is on a very reduced scale. The advance of the victorious army must be like the passage of a great rake, cleaning up the terrain, and bringing about the fall of the occupied positions. Of course, at some moments parts of the Front will be in advance of others, but that is because it is precisely this advance that causes the fall of the adjacent portions of the enemy's line. As soon as this retreat is accomplished, the Front straightens out of itself. Strategic manœuvring is reduced to its simplest terms; it consists in an organized and methodical advance of the Front until it encounters an obstacle.

. . .

We have now examined, in its general aspect, the mechanism of a great victory. It remains to examine those phases of the combat which take place between one position and the next; that is to say, the pursuit and the march of approach. Without repeating in detail those rules which I have endeavored to formulate in my "War of Positions," I should still like to make a few remarks about them.

These phases have not so far been seen, in their full development, on the Western Front. They

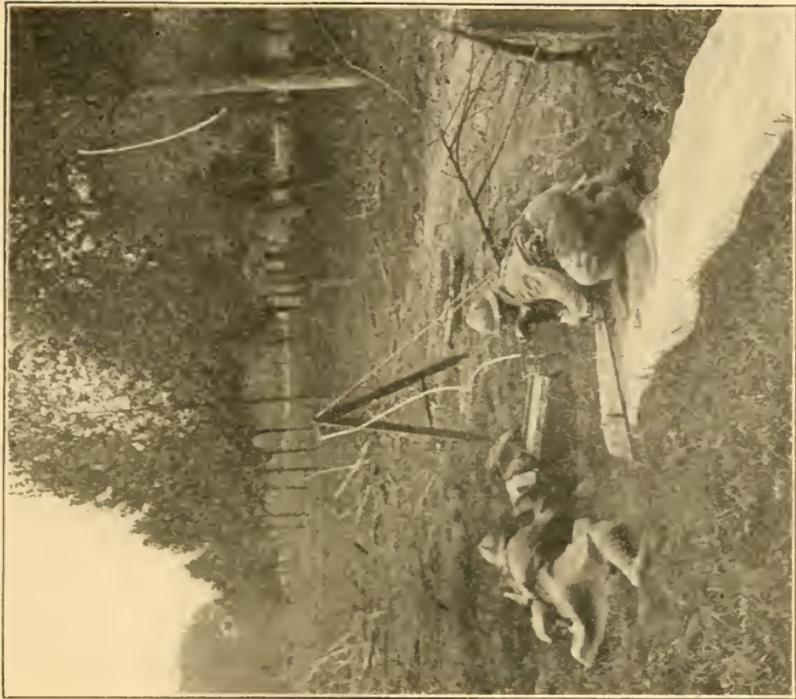
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occurred only at the beginning of the war, first when the Germans invaded France, then when the French drove the Germans back from the Marne to the Aisne. At that time, however, neither the armament nor the training of the troops had reached the perfection that has come with three years of warfare, so that all of the lessons that could be learned from them would be tinged with error. They have been seen recently in Italy, as a result of the German victory, but cannot yet be known in all their details.

On the other hand, these phases have succeeded one another under conditions which are not at all comparable with those which prevail upon the Western Front. The Russians, for instance, had an army which lacked artillery, arms, and munitions, but was protected by the extent of territory and the difficulties of communication. The Serbian army had no positions, but believed it could defend the country with rifles, and bayonets, and patriotism. In Rumania the army was insufficiently trained and supplied. It is impossible to compare such operations with those which would take place in a theatre of war where the two adversaries were of comparable material and moral strength as is the case on the French Front. I shall, therefore, give an ideal description of these two phases instead of an account based on my own experience, as I have done in



Motor wireless station; general view of the outfit set up for work



Portable wireless station; the sending end

LIAISON

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the case of the other two phases. But in the present war, if we are willing to be led by logic and common sense, we are not likely to go far astray.

The pursuit is that phase of the combat where, after the capture of a position, the object is to reach the retreating troops, to prevent their re-establishing touch with the adjacent units, and to cause the downfall of such positions as are still intact.

The essential condition for success is speed. The enemy must not be given the chance to reorganize. In order that the troops may advance rapidly, the progress of the reserves and the forwarding of the supplies of food and ammunition must be prepared with care. Furthermore, the first-line troops must constantly keep in touch with the enemy.

In this phase, as in the preceding ones, the commander is dependent upon the information which he receives, and bases upon it such orders as shall insure a continuous forward movement. The greatest care must be bestowed upon the establishment and the working of the liaisons.

The pursuit should usually be carried out by fresh troops drawn from the reserves. Some of them should be ordered to follow close upon the heels of the troops which were driven from the conquered position; others must take the adja-

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cent positions in the rear. These troops may have some difficulty in crossing the zone of shell craters and trenches, but usually they will find, after a short time, roads which are in good condition, because the enemy, who has needed them up to the last minute to evacuate his artillery and his convoys, has not had the time to destroy them. Moreover, detachments of engineers, assisted by fatigue parties, are given the task of repairing these roads as well as putting in order whatever else may be needed.

The cavalry finds in the pursuit the chance to play a long-awaited rôle which is at once gallant and useful. It possesses both speed and resisting power; speed through the use of its horses, resisting power by fighting on foot. It can throw the enemy's troops into disorder and demoralize them, pouncing upon isolated detachments and convoys. It can fire on such objectives as it sees, destroy important centres of communication, and disorganize positions which are still intact by taking them in the rear. It can also, in its numerous encounters with the enemy, pick up much information of value to the Command.

Alongside of the cavalry, or even ahead of it, armored automobiles, motor cannon, and motor machine guns can play a considerable part. By means of surprise and by means of fire they can involve the enemy in serious difficulties and cap-

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ture many prisoners. They can, in fact, cut off the retreat of whole corps, destroy or halt batteries or convoys, throw columns into a panic, and cut the communication between the front and rear of the adjoining positions. The information which they obtain and bring in themselves with all speed to some point in touch with the Command, may be of the greatest value.

The infantry is anxious, above all things, to press forward in order to strike the enemy. It alone is able to occupy and hold the conquered terrain; it digs in as soon as it is obliged to stop. Certain detachments are advanced rapidly and avoid fatigue by being transported in automobiles to the points where they can be of most use. Cyclist detachments also take part and help in establishing liaisons. They can also constitute a flying column, going rapidly wherever they are needed.

The artillery must take care constantly to accompany the infantry and to support it, either by destroying the enemy's artillery or by delivering a barrage against a *retour offensif* or counter-attack, or by demolishing obstacles which might hinder the advance. To this end it always should advance in echelons, according to the same principle as in the course of the attack. A sufficient number of groups must be always in place to fulfil the before-mentioned

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duties, while others are in process of displacement. Rapidity of displacement is of enormous importance, for thereon depends the rate of the pursuit. Everything possible must be done to facilitate this rapidity. The artillery can also help to destroy and demoralize the adversary, by pursuing him by its shells and by firing on all favorable objectives, such as bodies of troops, convoys, villages, cross-roads, etc.

The aircraft operates according to rules analogous to those which hold during the combat in the interior of the position. The planes are still specialized in their activities; some adjust the fire of the batteries, others are accompanying planes, and still others messenger planes. The fighting planes bring down the enemy's planes and balloons, while the bombing planes attack concentrations of troops, convoys, railways, etc. It is largely thanks to the information brought by the planes that the commander can make his decisions.

The engineers take charge of technical works for accelerating the pursuit and organizing the conquered terrain.

The supply service, both for food and munitions, takes on a great importance during this phase of the combat, for thereon depends in no small measure the success of the pursuit. If the troops are short of food or munitions, all their courage will be of no avail.



Region of the Mort-Homme near Verdun: a conquered German trench



Near Moulin de Laffaux, battle of the Aisne (1917): Engineers constructing a route
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The pursuit is characterized by a special tactical use of the different arms, infantry, artillery, aviation, engineers, and especially cavalry. Moreover, the march formations are not always the same throughout each arm. The troops form in column whenever possible, instead of deploying in line, as the first-named formation is more suitable to advance. They have special marching zones where the roads are distributed between the various columns. The specialists are no longer used as before; the flat trajectory weapons recover their importance; the rifle, automatic rifle, automatic machine rifle, and machine gun find many occasions where they are of use; the high trajectory arms are less needed. There is a special duty for the trench-cleaners. With the aid of specialists from the engineers, they seek out and destroy traps set by the enemy, such as prepared mines, cleverly arranged infernal machines, poisoned food left in evidence, etc.

In order that the pursuit may succeed, two essential conditions must be realized: the artillery, especially the heavy pieces, must be deplaced rapidly and they must always be supplied with the necessary ammunition.

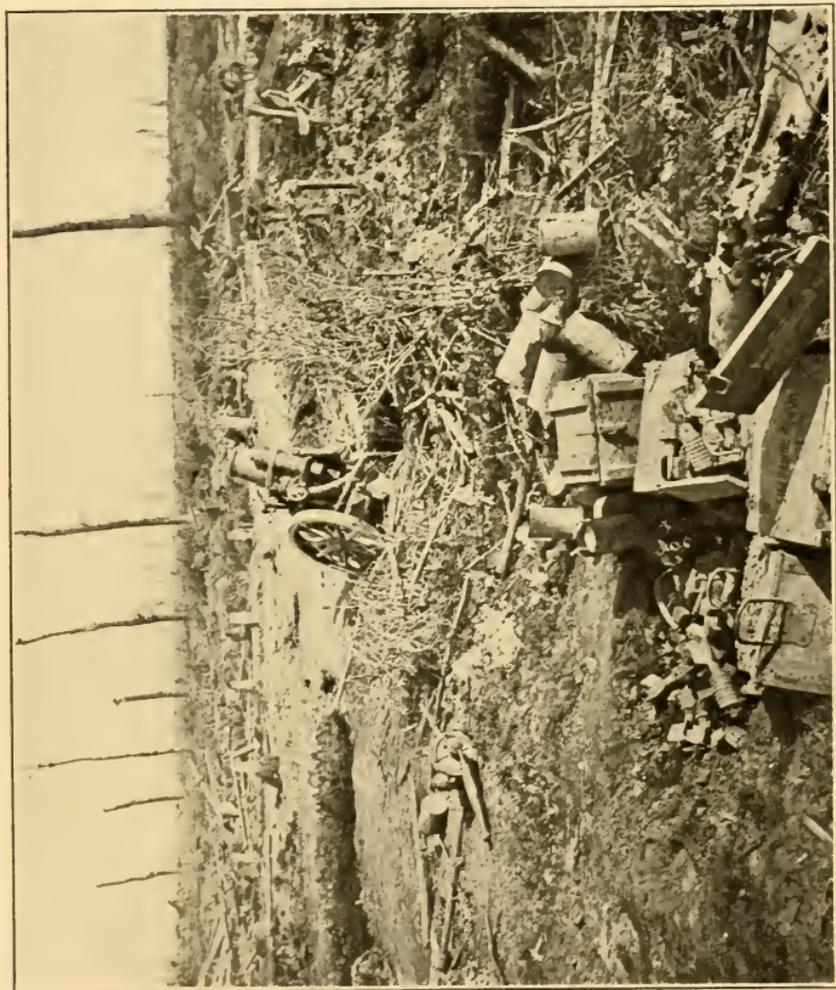
It often happens, in fact, that not only are the pursuing troops the object of counter-attacks, but they also run against organized positions. It is highly important that the infantry should

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not be held up by these positions, as a temporary halt might easily turn into a definite check, permitting the enemy to re-form. If, therefore, a rapid attack is possible, the mobile troops at the head of the pursuing columns, the light armored automobiles, the cavalry, the cyclists, etc., should make the attempt. Successes, which at first sight seemed impossible, have often been secured when the enemy is demoralized by a close pursuit. He may pass quickly through the best-organized positions, instead of making a stand in them. To sum up, prudence is the watchword during the preparation, and even during the attack itself; but audacity is an essential virtue in pursuit.

If the pursuing troops recognize that they cannot, even with the help of their accompanying artillery, seize the new position by a sudden attack, they must once more follow the counsels of prudence. The troops must come as close to the position as possible before undertaking a new preparation and a new attack. They should follow the example of the caterpillar, who stretches out to go ahead, but curls up when he wants a good start for his next advance. This new phase of the combat is called the "march of approach."

The march of approach is intended to bring the troops within assaulting distance of the new position with a minimum of loss.



AFter AN ADVANCE

To the northeast of Bixchoote, Belgium. Supply station of German sappers
A "Minenwerfer" in the foreground

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The success of the operation depends upon how correct and specific is the available information about the position to be attacked. The troops should in fact be brought opposite to their objective, faced in a direction suitable to the undertaking before them, and sheltered from useless and premature losses.

The mobile pursuit troops should give passage to the infantry, furnishing them with all possible useful information. The infantry should also learn all it can for itself. It should remain in column as long as possible, but never, on pain of enormous losses, present this formation to artillery fire. It must be on watch to form in small columns or in line as soon as the moment comes.

The other arms coöperate to protect the infantry and to reconnoitre the opposing position. The artillery follows at a proper distance, installing observing-stations and emplacements. The aircraft accompanies the infantry and adjusts the artillery fire. The engineers mend the roads and improve the means of access. The cavalry returns to its old place, in the rear of the other arms.

After a longer or shorter preparation, and after the Command has given the order, the attack is launched. If it fails, then a new period of stationary fighting begins, with the usual system

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of trenches. If it succeeds, the pursuit will continue until the enemy is destroyed, or, at least discouraged enough to acknowledge himself beaten.

. . .

If we take a general view of those means which can bring victory, we see that in the front rank stands coördination. The Allied Powers must be drawn together still closer in the bonds of friendship and coöperation if they are to reach the goal at which they aim. The common use of their resources should be carried out without selfish calculations and fruitless discussions, in which each participant reckons up the value of his stake and the winnings which it may bring.

In a crisis of this magnitude we must think in large terms. The Allied nations are fighting for something else besides the restoration of territory seized by force or the satisfaction of personal aims; they are fighting to rid the earth of autocracy, violence, and barbarism; to make way for liberty, justice, and peace.

Let me at once say that America, perhaps more than any other nation, has given proof of her devotion to these ideals. She entered the war with no hope of material gain. The realization of her ideal will, moreover, permit her to develop freely in future; an impossibility were Germany

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victorious. President Wilson recently pointed out this truth to the American workingmen in his Buffalo speech. He said, in substance, that any one who supposes that industrial freedom could be maintained in the world after the realization of Pan-Germanic ambitions, must be as mad as the dreamers in Russia.

Are there no silly dreamers except in Russia? Alas, they are everywhere. They prate of peace when whole nations are groaning in misery and slavery, and barbarism is methodically and scientifically organized as never before. They even talk of the Right, saying that in the forthcoming negotiations it will protect the weak and the innocent. Did the Right protect Serbia which made humble submission to keep the peace? Did it protect Belgium, the victim of savage aggression in spite of treaties? Did it protect the French provinces, invaded as a result of the violation of Belgium? Have those who now talk of peace faced the consequences of a premature peace? It would be a slavish peace, handing over the free peoples to the brutal omnipotence of Prussian militarism. It would be a shameful peace, throwing humanity back centuries in its progress.

These same dreamers are asking whether the Allies, when they are finally victorious, will demand territorial guarantees, annexations, and conquests. What is the use of such questions

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while our soldiers are still fighting? This is not the moment for discussion, but for action. We must first make sure of the triumph of liberty over violence; after that we shall judge the crimes against humanity. We shall know how to be just and generous, but, first of all, we must be victorious.

This war will never be won by economic means or steps taken to aggravate Germany's economic condition. How often have people imagined that privations, lack of raw material, and shortage of food would finally vanquish Germany! All these conditions may add to the sufferings of our adversaries, and so help to wear them down physically and morally; but they cannot bring victory. The Germans, under the Mailed Fist, have sterilized their emotions and given their bodies over to slavery; they are not so sensitive as people imagine to moral and physical attrition. They suffer greatly, but they resent their suffering like an animal who does not understand the cause of his distress. We must always repeat the famous phrase: —

“Victory goes to that contestant who is able to suffer a quarter of an hour longer than his adversary.”

The German morale has not sunk so low as is sometimes imagined, but it is sinking. Already their prisoners, instead of taking an arrogant

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tone, repeat unceasingly: "We never desired this war." This is a symptom betraying fear of punishment. We must always maintain a morale higher than theirs, and to that end we must know how to support that suffering which the war inevitably brings. America, so far, has suffered little. She will be obliged to suffer in the near future, and she will know how to bear her sufferings. And she will have to suffer much less than Germany.

Victory will come only by force of arms. We have already had victories in France, but they were of a defensive sort; the Marne halted the barbarian invasion, the Yser kept open the line of communication with England, Verdun broke the supreme German effort against France. Germany has since learned that she can do nothing against a people who resist in such fashion; she has sought for compensation in other quarters. Now it is our turn to break the Front, now it is for us to win an offensive victory with thousands upon thousands of prisoners, to gather laurels and garlands in the gardens of Berlin. It can be done. Twice, at least, before now, we have been close to victory; in Artois in May, 1915, when all that was needed was a few reserves to pour through the breach which had been opened; on the Somme in July, 1916, when we should have pushed boldly ahead,

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instead of being over-prudent. We have missed these chances, but we shall have others. We know our weaknesses; we have but to mend them. We have all that is needed to win, men, money, matériel; we merely need to learn to coördinate our efforts, and to act with energy, method, and discipline.

Victory depends entirely upon us. It is a question of will; let our will for victory be the stronger. All of us, men and women, must bend our strength and intelligence to the service of that sacred cause which binds us together. When we do that, I promise you that the bright star of victory shall shine in our sky.

VII

THE DEFENCE OF A POSITION

LECTURE OF NOVEMBER 26, 1917

SUMMARY

Definition of defensive combat. — Definition of the defence of a position. — Case in which the defence is imposed. — Forms of the defensive: stationary fighting, defensive combat. — The four phases of the defence of a position.

The organization of the defence. — Detailed study of the two opposing positions; battle maps; personal inspection of the position to be defended; ground and aerial observation; posts for location by sound; ground telephoning; *coups de main*; an example.

The material *aménagement* of the position. — Plan of defence: plan of reënforcements; plan of works. — Echelonment in depth. — Continuity of the first line. — Execution of a reënforcement. — The rear of a position. — Measures in case of retreat.

The physical and moral preparation of the troops.

Defence of the position. — The maintenance of the troops under bombardment; measures adopted.

Defence of the first line; mines; accessory defences; fighting against the tanks; rôle of the infantrymen; machine guns; rôle of the artillery; hand-to-hand combat.

Fighting in the interior of the position; counter-attacks; liaisons.

Retreat. — Its two forms. — Realignment of the Front and its advantages. — Retreat under hostile pressure and its difficulties; the rôle of the artillery; holding of a new position.

Retour offensif. — Its rules. — Its results.

Conclusion. — The defence of a position may be a victory like Verdun.

THE *defensive* along a front or in a position may be defined as the situation of a body of troops whose object is to defend themselves against hostile attack.

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The *defence* of a position consists in the sum total of the measures taken by the troops to prepare and execute a combat against an attacking enemy.

The defensive in itself can never lead to a decisive result. For that reason it is permissible only when the end in view is to wait for a favorable moment to undertake the offensive.

At certain points the defensive is necessary. There may be an insufficient supply of men or matériel or of munitions. The geographical or topographical situation may be unfavorable. There may be tactical advantages in holding the occupied points.

The first of these cases is the most frequent. On account of the enormous effectives required for an offensive, it is necessary to stay on the defensive in a certain number of zones of the different fronts. The second case results from the difficulties and the consequent useless losses of men and of energy which would result from an offensive in certain zones. The third case arises when the occupied positions give a great advantage over the enemy. For instance, the possession of certain observing-stations may make it possible to cause him daily serious losses, thus increasing his rate of attrition. A gain of territory would be of no benefit at all if it involved the loss of this advantage, and especially

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if it placed the seemingly victorious troops in a less favorable tactical situation. In such a case there is no advantage in a displacement, unless the whole Front moves forward as a result of a success in a different zone.

When the enemy is not attacking, the defensive amounts merely to occupying the terrain. This is the period of stationary fighting which has been already studied. It is life in the trenches. Duties in the position, frequently called also duties in the sector, consist in preparing the terrain both for the defence of the position and for the attack of the position opposite, which must always be kept in mind.

When the enemy attacks, the defensive takes the form of combat — that is to say, of defensive combat. This is usually carried out along a considerable front, including several positions in lateral contact. If it takes an unfavorable turn, it may be continued in successive positions echeloned in depth. In fact, when one position is lost, the only way to stop the enemy is to defend another position, and so on.

On the defensive as on the offensive, in order to have an idea of the whole combat, it is sufficient to study the defence of a position.

The defence of a position is intended to keep that position; but this particular aim is subordinate to the main object of the war — the destruc-

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tion of the enemy's army. In fact, the defence of a position offers excellent opportunities to inflict losses upon the enemy and may even sometimes bring about his defeat.

It includes four parts:—

- (1) The organization of the defence.
- (2) The defence itself.
- (3) The retreat, if the enemy is victorious.
- (4) The *retour offensif*, to retake lost ground.

The description of the first two phases will give opportunity to recall many of the principles which were explained in the description of life in the trenches, or the period of stationary fighting.

. . .

The organization of the defence includes a number of parts, usually carried out at the same time. These are: the detailed study of the two opposing positions; the material *aménagement* of the position to be defended; the physical and moral preparation of the troops.

The detailed study of the two opposing positions presents the same advantages as in the case of the preparation for an attack. Certain details, however, are particularly important.

The position to be defended is known by the guiding maps. These maps are generally drawn to the scale of 1:10,000. They show all the

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trenches and all the boyaux as well as such works as narrow-gauge railways. They do not, however, contain any indication of the accessory defences, the command posts, the distribution of the troops, the machine guns, or the artillery. These maps are never given to any officers of lower grade than regimental commander of infantry or group commander of artillery. They are completed by their individual owners, when that is necessary. But they are kept secret. For that reason they are never taken to the first-line trenches, for fear of being captured in a hostile raid.

Besides this the officers and men should go about in the position. This is the only way in which they can learn thoroughly the system of trenches and boyaux as well as the different passages. This knowledge has numerous advantages. It permits of rapid and easy execution of reliefs. It diminishes losses, by causing precautions to be taken at dangerous passages. It facilitates, even during the night, the lateral movements or reënforcements, retreats, *retours offensifs*, and counter-attacks.

The opposing position should also be known as well as possible. The attacking troops of the enemy will start from there and their plans and dispositions will be dependent upon its nature.

Preparations needful for an attack are always

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considerable. Even if the enemy does not give the alarm by a particularly intense artillery preparation or by a redoubled activity of his aircraft, he is forced to make certain arrangements of his positions which should attract attention, such as the construction of new emplacements for batteries and observing-stations, the digging of trenches and boyaux, the concentration of troops at certain points, the creation of dépôts for munitions and food, increased use of railway lines and roads, and works of preparation on the first line, such as saps, departure parallels, and openings in the accessory defences.

The observers, both aerial and on the ground, should redouble their vigilance to note all these signs.

Aerial observation makes it possible, by the aid of photography, to furnish plans of the enemy's works, to show their form, to keep the battery maps up-to-date, and to point out movements and concentrations.

Observation on the ground is indispensable to complete and sometimes to replace aerial observation. It has the advantage that it can be carried on in all weathers, both by night and by day. Not only is it permanent, but it is more detailed, because it includes many matters which the aviators cannot see. At times it is even more rapid on account of telephonic connection. The

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artillery observer, like the infantry information officer and the watcher at his post, should feel the importance of bits of information which at times appear insignificant. These should be communicated to all the units and to all the arms which may be interested as well as to the Command.

One means of observation which has sometimes given excellent results is the location of batteries by sound. My stepfather, Honoré de Villard, who was an advocate of this method and who experimented with it in his artillery regiment at the beginning of 1915, explained its utility in the following terms of his report: —

“We can evidently not pretend to execute a rapid or sure fire upon a battery if we cannot adjust this fire; that is to say, if we do not see what we are doing.

“The observers on the ground, even when they see the flashes and the smoke, which is seldom the case, are yet unable to pick out the emplacements, which are almost always out of sight. The observers in the air, even if they see these emplacements, cannot generally be sure that they are occupied unless they see the flashes.

“In our ordinary daily firing the enemy's batteries are in action so intermittently that we can seldom find them by means of airplanes. As for the stationary balloons, the necessity to keep them in safety makes it impossible for them

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to do any very effective observation. We are thus forced, during daily artillery duels, to have recourse to another sense, namely, hearing, to help out where our sight fails us.

“The consequence of all this is that fire adjustment is impossible. We must resort to zone fire.

“My method for discovering batteries, which is founded upon a knowledge of the calibres, and fire tables, and on the velocity of sound, has no other pretension than to reduce the limits of the zone of fire. The photographs of the airplanes should serve as a check. The method will be complete only when all the infantry N.C.O.’s help us with their eyes and ears. It has already been of real service and has saved not a little ammunition.”

This method was adopted in the month of June, 1915, by General Joffre, who ordered the explanation of it and the numerical tables for its use to be printed for all the armies. Special posts, called “posts for locating by sound,” were created and improved little by little.

If several of these posts hear the sound of one of the enemy’s pieces, and note their observations simultaneously, the comparison of these diverse data makes it possible to determine the location of the pieces. In this way it is possible to locate a piece within a square one hundred

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yards on a side, or even less, so that the field which an airplane must observe, either visually or photographically, is considerably reduced. It is easy to see how important it is for the defence to know the situation of the enemy's batteries. It is fair to say, however, that this means of observation works well only when the enemy is firing little.

Telephoning through the ground is a highly useful method of observation. With regard to this, however, it is not permissible to give details, even though it is perfectly well known to our enemies and was probably used by them before we found it out. It is often the means of learning important secrets.

A raid constitutes a very good way to get exact information of the enemy's position. In a raid prisoners can be captured, from whom we may learn the details of the enemy's position, the works which he has undertaken, and the intentions of his officers. It is also possible to pick up the numbers of the regiments engaged, as well as documents, letters, or papers giving precious information. Finally, a raid may have, in addition, results of a tactical or moral nature.

On the 23d of February, 1915, when I was in command of the centre of resistance of Passchendaele, I had occasion to carry out a raid. I invented, without suspecting that my method would

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one day be regularly employed, the system of a rolling barrage in front of my reconnaissance. I also ordered lateral barrages to be laid down at the same time to prevent a counter-attack. My quartermaster-sergeant, Montelbetti, who has since been killed, was thus able, in broad daylight, at the head of a few men, to go four hundred yards from our trenches along the famous slopes of Passchendaele and to bring back information without losing a man.

Brigadier-General Aimé, who has since been killed, heard of my raid before receiving my official report on the subject, and sent me a note which showed his proper anxiety to avoid useless operations:—

“Being unable to see clearly the utility of the reconnaissance, carried out yesterday, the 23d of February, by the second battalion of the Sixty-ninth Regiment, the general commanding the sector begs the commander of the Sixty-ninth to inform him of the exact object of this operation.”

I drew up a new report in the following terms:

“The exact object of this operation was:—

“I. To destroy an observation post, from which, according to the reports of the preceding days, an artillery observer was apparently able to adjust a very accurate fire on the Sixth Company (e.g., the command post of the captain was destroyed and, on the 21st of February, the

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shelters constructed the night before by the engineers for the Sixth Company, were taken under fire); to stop or lessen in this way a fire which was very destructive to the right-hand end of the line.

“2. To carry out a search in this post by means of a detail for sketches, information, blank-books, notes, shoulder-straps, etc., which might be found on dead or wounded or prisoners, after the destruction of the post.

“3. To reconnoitre the general condition of the adjacent German trench, from which every night rockets are sent up and rifle fire is let loose, in order to see if it is strongly or weakly organized, if there is water in it, and also, in case of a further offensive, if we could cling on to it.

“4. To determine in advance the ease or difficulty of a possible forward movement, by successive feeling-out of the Front.

“5. To reconnoitre the road which a counter-attack might follow in case of a hostile offensive.

“6. To show the battalion the effect of barrage and to give it confidence in the support of our artillery.

“7. To maintain among the companies of the battalion a spirit of activity, a taste for the offensive, and military competition — all of which have a tendency to grow less in trench fighting, but which will doubtless be necessary in the spring.

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“8. Lastly, these different objects are in accord with the wish expressed only this morning by the general commanding the sector, on the occasion of his visit to the Front, that we should show a certain amount of activity.”

This report epitomizes in a single example the different purposes which a raid might accomplish. It was, moreover, well received at Headquarters. For one thing, Montelbetti was mentioned in orders and his companions were all nominated soldiers of the first class.

Another possible object of a raid is to conquer an observing-station. Under these circumstances it is really a small offensive action, because it helps to keep the ground. It is justified by the principle that we should try to keep the enemy from seeing us while we continue to see him.

The commander of a small unit should never carry out a raid merely with the object of taking a few hundred yards of trench. The real reason for a raid of this sort is heedless ardor or an unhealthy desire for notoriety. Such operations have been too often undertaken by the Allies in the course of the campaign and have cost a large amount of useless bloodshed.

The material *aménagement* of the position is intended to prevent the enemy's troops from getting into the position, to hold them up if they

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get there, and to drive them out. It is carried out according to a plan drawn up by the commander of the position, which is called the "plan of defence." Before drawing up this plan the commander of the position, aided by officers of his staff, carries out the necessary reconnaissance. He takes account of all the ways and means by which the enemy can execute an attack, and makes arrangements to meet every eventuality.

The plan of defence is drawn up for the garrison which habitually occupies the position and should defend it from attack. It points out the special duties assigned to each unit, studies the liaisons which should connect the various units, and makes all the necessary arrangements for bringing up supplies and for sending back the wounded.

The plan of reënforcement consists in arranging to bring into the position supplementary units, to increase its capacity for resistance. This plan arranges the places which the new units should occupy, the way in which they should establish their liaisons or amalgamate with the troops already in place. It arranges what groupings shall be made and what systems of command are suitable.

The plan of works is the important corollary of the plan of defence, the fundamental ideas of

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which it carries out in practice. It is carried out by all the troops involved, — infantry, artillery, and engineers, — each one being employed on the works which belong to it. There are also fatigue parties sent to help with these works, the engineers acting in an advisory capacity. The plan of works is carefully kept up-to-date and must be neither modified nor neglected at the time of reliefs. It is kept in the archives of each sector and under the charge of certain officers permanently stationed there, to maintain a continuity in plans and to facilitate reconnaissance. The officers of the staff should make sure of the proper execution and of the state of advancement of all works, and propose such improvements as may seem to them necessary.

The great principle which should guide the commander in making his various plans is echelonment in depth. Trenches, field works, machine guns, and batteries should be arranged in this way, so that if the enemy captures the first he will find others behind.

Too dense occupation of the first line has the disadvantage of exposing masses of men to bombardment by hostile artillery. Of course deep and strong shelters can be constructed; but if such shelters are fired on by the enemy, they are certain to be destroyed together with a considerable number of men. Moreover, if

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the entrances to these shelters are blocked by bombardment, or if there is a cave-in, they become tombs. The first line should, therefore, be defended only by isolated posts. The posts of the watchers should be reënforced at the points which seem most liable to attack.

A too great insistence on the principle last enunciated has given rise to the idea that it is better to have a discontinuous first line made up of little watching-posts isolated from one another. This procedure has serious disadvantages. Not only are posts which communicate with one another with difficulty less able to transmit information, but they are less secure in themselves and can easily be captured by a patrol or a raid.

The fact that a sufficient artillery preparation always transforms a continuous trench into a discontinuous one is not a sufficient reason for making the trench originally discontinuous. Separate elements of trench would be objectives for the combined fire of the enemy, whereas in the case of the continuous trench the enemy cannot know which elements are selected to offer resistance. If he reaches an unoccupied element, he can be enfiladed by an automatic machine rifle alongside, or decimated by grenadiers on a lateral platform. If he arrives at an occupied element, he is surrounded by reënforcements arriving by contiguous unoccupied elements.

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The trenches, like the troops, and the shelters which contain them, are arranged in depth, presenting a decreasing density from the front towards the rear. The troops in the rear can always, upon the first alarm, come to the help of those in front. And even if they are a little late, they can automatically carry out a counter-attack. They have had the advantage of remaining under shelter during the bombardment and they arrive, fresh and intact, at the very moment when they can be most useful.

It must be remembered that reënforcement does not imply a forward movement of all the troops arranged in depth. On the contrary, certain units of infantry, machine guns, and groups of grenadiers should be stationed in trenches or other suitably arranged works to halt the enemy's advance. These troops are expected to execute a counter-attack either by movement or by fire. When they are expected merely to fire, they should be placed in a carefully chosen situation, such as trenches on a counter-slope, flanking elements, or barricades blocking the way.

Concealment of the field works by the slopes of the ground is an essential principle in the aménagement of the interior of the position. Camouflage is no less important, and leaves the enemy in ignorance as to where he may expect to encounter resistance. It is especially neces-

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sary to hide the observing-stations, as their discovery, and consequent destruction, deprives the defence of one of its principal elements.

The rear of the position should be prepared with as much care as the interior. All ways of communication serving to bring up troops, munitions, and food should be multiplied and maintained. Certain fatigue parties should be entrusted with their permanent maintenance. A rigorous policing of traffic will prevent congestion and delay. All arrangements must be made both for supply and evacuation. If a retreat becomes necessary, neither matériel nor supplies nor munitions should be allowed to fall into the hands of the enemy. What cannot be removed must be destroyed. Moreover, it must be arranged to destroy all means of communications so as to retard the enemy's advance.

Retreat is a regrettable operation, yet it must be taken into account, on pain of leaving troops, without officers and without orders, exposed to a victorious enemy. For this reason, the commander of a position should work out all the measures necessary to install his troops in a second position and to define the duties which they must fulfil therein. To this end he must make sure of his liaisons both with the front and the rear, taking such wise precautions that a local failure will not turn into a general disaster.

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The physical and moral preparation of the troops is the same as for the attack. But the troops who have been to rest are expected not only to relieve the tired troops in the trenches, but to furnish units ready to execute counter-attacks.

In every case the officers should inspire the men with a real affection for the position entrusted to their care. They should impress upon them that its retention is a point of honor. A body of troops should be ready to be killed to the last man rather than abandon the terrain to the enemy. This feeling is much easier to develop than might be supposed, especially when the men have been for a long time in the same place. For instance, in Belgium in the sector of Lange-marck, Saint-Julien, Zonnebeke, my soldiers, who knew every nook and corner of the region, were really attached to the spot, in spite of their terrible sufferings there. When, in April, 1915, a few days before our departure for Artois, they learned that their position had been captured by the Germans, they felt the same consternation that a man does who hears of the capture of his native town. This feeling will greatly strengthen the power of resistance.

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THE DEFENCE OF A POSITION

The defence of a position is intended to prevent the enemy from seizing that position, by inflicting the greatest possible losses upon him.

It includes various parts: the maintenance of the troops under bombardment, the defence of the first line, and, if this first line is forced, the struggle in the interior of the position.

The maintenance of the troops under bombardment is the first requisite for a good defence. Whatever care is taken to avoid losses, there is only one way to prevent the enemy from invading a position — that is, to keep the position constantly occupied. Of course the men should be scattered about and sheltered. But their disposition should always be sufficiently close-knit, so that an attacking body may not advance easily by merely breaking through in two or three places.

Every attack is preceded by an artillery preparation. The men must be able to meet this, while fulfilling more carefully than ever the duties of the position, such as observing the enemy and firing on his organizations or his batteries. The artillery preparation is carried out on the whole of the position, but it is generally more violent and more carefully directed on the first line of trenches. The necessary watchers should be protected as well as possible and should be placed in the vicinity of shelters where they can

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find cover instantaneously. It is even permissible for one or more of them to be under cover while one alone is observing. The necessity for continuous observation must, nevertheless, take the precedence of considerations of personal safety. The slightest inattention may let slip that critical moment when the enemy's attack is launched, and may consequently prevent an effective reply. Instead of being in shelters which are carefully organized, but are targets for the enemy's fire, it is often well for the watchers to be in shell craters arranged for them beyond the regular line of trenches. They may find themselves most advantageously situated there, both for observation and for safety.

The defenders of the position echeloned in depth should be as well protected as possible. Most of them are in deep dugouts, provided with two or more entrances, and with sentinels at the mouths. The object of these sentinels is to give the alarm in case of gas or of an attack. Every soldier, no matter what he is doing, must always have his arms and his gas mask by him.

The period of bombardment requires a much greater show of energy than the period which precedes going over the top. It is hard to imagine the impression which is produced by an intense and continuous bombardment, lasting several days. The men must remain underground with-

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out the light of the sun or pure air. Shells are continually arriving, any one of which may immediately bury them. They are relatively isolated on account of the difficulty of communication. All these things produce in many men a real state of stupor. Besides this, the bringing-up of supplies, even during the night, becomes sometimes quite difficult, so that this trouble is added to the others. Last of all, after most trying days, the men must have the courage to work at night to repair the damage caused by the shells in order to maintain the smooth working of the communications, the capacity of resistance of the various obstacles, and the security of the shelters.

The only way to diminish the intensity of the bombardment is to silence or to neutralize the enemy's batteries. Observers in the air and on the ground make every effort to find out where these batteries are, and to adjust the fire to them. A zone fire will not suffice; specific objectives are needed. If the destruction of the hostile batteries cannot be effected, a discharge of gas shells, either poisonous or lachrymatory, may have the result of visibly diminishing the intensity of the enemy's fire and, hence, of lightening the task of the defenders of the position.

The defence of the first line is carried out by means of close collaboration of all the arms —

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infantry, artillery, and aircraft. It must be seen to with the greatest care, for even though the capture of this line does not cause the fall of the position, it may still have a considerable moral effect on the defenders and facilitate the progress of a bold enemy.

The use of offensive mines cannot produce an important result in this sort of defence. It is a good plan to have subterranean listening-posts to find out the enemy's plans, and it is necessary to construct counter-mines in order to destroy his mines; but generally it is unwise to undertake a subterranean war without any precise object. The only useful defence of this sort is to construct *fougades* and mines to be exploded if the enemy manages to seize an important point, such as an observing-station. Even in this case the effort required is generally disproportionate to the result obtained.

Accessory defences, such as wire entanglements, *chevaux de frises*, and *trous de loup*, constitute the surest means to break the spirit of the attacking troops. They must be kept up as well as possible and repaired during the night. Even if they have been considerably damaged by the bombardment, they suffice to hinder the advance of the assailants and to hold them for a considerable time under the fire of the defending artillery and infantry.



Fort Vaux, near Verdun, east of the Meuse, April 17, 1916



Fort Vaux, during a bombardment

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As soon as the enemy's attacking wave leaves the trench, the observers give the alarm. The barrage is then laid down before it, while a violent fire is directed upon the departure trench and the trenches behind, where the attacking troops are assembled.

If tanks precede the infantry, they should be taken immediately under a direct artillery fire. For this purpose certain counter-batteries should be especially designated to fire on them, for tanks are a real mobile artillery which it is necessary to destroy, the moving barrage being replaced by the pieces themselves. There are, moreover, other means of interfering with the advance of the tanks. For instance, it is possible to prepare large and carefully concealed ditches at the points where the monsters are likely to pass. This procedure, which is nothing but a development of the traps set for wild beasts, makes the tanks tumble over in such a way that the infantry cannot possibly set them up again.

The tanks can produce surprise by appearing unexpectedly and destroying the accessory defences by the simple process of passing through them, without the aid of artillery preparation. But their advance up to the first line is beset with difficulties when the observers are attentive. If, in spite of the artillery fire and in spite of all the means taken to upset them, such as trenches,

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mines, explosions, etc., a certain number of tanks break through the accessory defences, the first-line defenders need not be alarmed. These moving monsters cannot come and trouble them individually in the trench elements or shell holes where they have taken refuge.

Isolated pieces of artillery, and even advance batteries, which have previously been silent in order to avoid premature destruction, are unmasked at the proper moment and open fire either on the enemy's infantry or on his tanks. Under these circumstances pieces which are moved on rails can be brought almost immediately to emplacements which have been prepared in advance and carefully concealed, and can render invaluable services. Moreover, the rails will make it possible to move them under cover as soon as their task is accomplished.

The defenders of the first line are composed, not only of the watchers and the small posts scattered round in the shell holes, but also of units from the vicinity, from the doubling trench and the transversal trenches. At the first alarm all these men run to the stations which have been assigned to them. It must not be imagined that they are placed like the fighters in the illustrated magazines, at successive loopholes through which they poke their rifles. At this stage there are no more loopholes, if there ever were any. And

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in many places there are no more parapets. There is no more trench. There are merely certain shattered trench elements in which groups of men decide to offer resistance. They have kept their arms in good condition during the whole period of bombardment and are ready to meet the attack.

Machine guns are placed at good points for flanking and have a considerable effect. Automatic machine rifles, automatic rifles, and rifles are placed on the relics of the parapet or are arranged in shell craters. Hand and rifle grenades are also used when the distance is suitable. The men who handle these weapons become less and less exposed, owing to the fact that the enemy's artillery preparation and barrage must go beyond the first trench in order that his infantry may enter it. For this reason the first line of defence can cause considerable losses to the assailants, especially when these are struggling with the remains of the accessory defences. If tanks have opened good passages through, these passages constitute, as it were, defiles, where a well-directed fire of machine guns and of artillery may have considerable effect.

The artillery delivers the barrage, arranged in the plan of defence or called for by the infantry. It may also have the chance to take hostile columns obliquely or in enfilade; and it must not

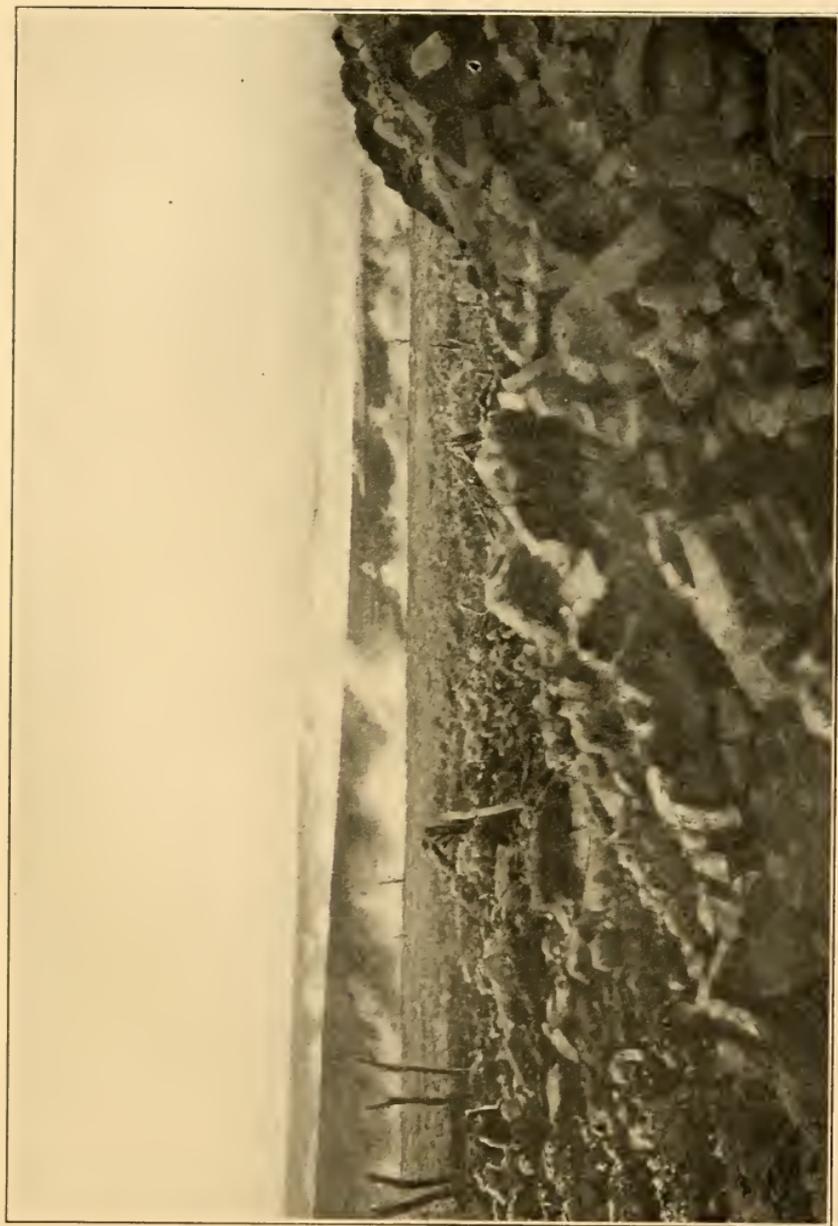
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let such a chance escape. To this end the Command can arrange a certain amount of regrouping of the artillery, a part of which may have been decided on in the plan of defence.

In spite of all the means of defence so far described, it seldom happens that a well-prepared and energetically carried-out attack does not manage to reach the first line. At that moment the defenders resort especially to the grenade and the bayonet. The attackers, further reduced by this hand-to-hand fighting, are sometimes so much exhausted by their efforts and demoralized by their losses that they are ready to surrender. If groups of the enemy have managed to seize one element of trench and endeavor to go forward, the defenders of the adjacent elements attempt a *retour offensif* at this point, before the new occupants have had the time to organize.

The defence of the first line does not at all resemble a regular combat spread along a definite line, but a struggle composed of a thousand little incidents. As on the offensive, it is unity of aim which establishes the most certain liaison among all the troops. Every fighter knows that he must resist at all hazards and preserve the terrain which he occupies. It is this thought which tells him at any moment what to do.

The struggle in the interior of the position



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At Verdun: an artillery barrage

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presents certain analogies to the defence of the first line, since it consists in defending successive trenches. It has, however, one different characteristic, owing to the fact that the assailant, instead of appearing in the open, finds numerous means of shelter, such as elements of trenches, sections of boyaux, or shell craters; barrages have become difficult, because the position of the attacking line is hard to determine; in the confusion of the fight they might produce deplorable results. The combat tends more and more to split up, and is the work of small groups of men frequently employing high trajectory arms.

There are, nevertheless, many occasions to use the flat trajectory arms also. Machine guns, echeloned in depth and placed in advance in transversal trenches or suitably chosen emplacements, may fire obliquely or in enfilade upon those passages which the enemy must follow. They may thus come into play unexpectedly, at the very moment that they can cause the greatest loss, and can produce a considerable effect, both on the moral and on the material side. A single machine gun, which has been kept intact by an armored and concealed shelter, can hold up important effectives for a long time, thus giving a chance for the defenders to re-form, or for reënforcements to arrive.

Trenches on the counter-slope are among the

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most serious obstacles which the assailant can encounter, and should, consequently, be organized whenever possible. They may be artificially created by digging away the ground. It is hard to adjust artillery fire upon their accessory defences, and the form of the ground itself gives additional protection. If the assailant is to overcome them, he must have with him either mortars or tanks. The mortars which have been used up to this point cannot follow the infantry in the capacity of accompanying cannon, but the tanks can. They can overthrow these trenches if they manage to get up to them; but here, even more than in the first line, it is possible to put the tanks out of action by artillery fire, by large ditches, and by explosions.

Counter-attacks are the best means of stopping the progress of an assailant within the position. They are carried out by fresh troops and are launched at the moment when the enemy, fatigued or discouraged, shows signs of hesitation. They can be delivered at night, for the defenders, familiar with the position, have a great advantage over an enemy who has not had the time to learn its details.

Under all circumstances liaisons play an important part in defence. They permit the different troops to help one another. They are frequently quite hard to maintain at critical



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Troops ready for a counter-attack, under the bursts of shrapnel
Avocourt, near Verdun, April 30, 1916

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moments, requiring boundless devotion on the part of the men entrusted with them. When one position is attacked, the men in the adjacent positions, whether or not engaged themselves at that moment, must pay careful heed to what is going on. They may frequently, by a counter-attack, executed at the proper moment, give a chance to the defenders of the position to regain the ascendant.

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Retreat is the consequence of a partial or total success of the enemy's attack either upon the position itself or upon a neighboring position. It consists in abandoning, at the order of the Command, a part or the whole of the position. It involves evacuation of the personnel and the matériel and their installation in a new position chosen beforehand. It is carried out with the intention of retaking the evacuated terrain.

Retreat assumes two different forms, according as it takes place at a moment chosen by the defenders, or under the exigencies of the attack. In the first case it is called a realignment of the Front; in the second, a retreat under pressure of the enemy. It is always the result of a success on the part of the adversary and is intended to avoid useless losses among the defending troops.

The realignment of the Front is intended to

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maintain liaison with troops who have met with defeat in an adjoining zone, or to improve a tactically dangerous situation.

When a part of the Front has been successfully attacked, and the enemy has seized it, it is necessary, in order to avoid a breach in the line of positions, to reëstablish a continuous front. In the same way, if one part of the Front, as a result of the chances of battle, has come to form a salient, the holding of which does not give important technical advantages, but involves, on the contrary, considerable daily losses, it is wise to abandon it.

The realignment of the Front must be carried out rapidly and without the enemy's perceiving it, for it is a very delicate operation. If the artillery is removed little by little, so that its activity decreases progressively, the enemy may launch a sudden attack, catch the infantry undefended, and destroy it. If, on the other hand, the artillery is kept in place until the last moment, and is obliged to leave, in large numbers at a time, at the same moment as the infantry, thus encumbering the roads, an attack taking place during this confusion might cause a disaster.

The realignment of the Front should be carefully planned in advance. Withdrawal of the troops should be carried out as much as possible during the night, in order to escape the observa-

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tion of the enemy. The enemy must not be put on guard, for fear of a sudden attack and intense bombardment.

When the Front has been realigned unobserved, not only are there no losses, but it is possible to inflict loss on the enemy, which is, after all, the object of all operations in war. To this end a line of lightly armed infantrymen can be left in the abandoned position, in order to occupy the enemy's attention. When the enemy does at last notice the weakness of the resistance, he undertakes an attack. He obtains an easy success and, growing bolder, begins a forward movement. At that moment he may be decimated by skilfully-placed batteries or by mines prepared in advance.

This operation, which had never been executed on a large scale before 1917, was first seen at that time. It was carried out by the Germans along a considerable front, in just those forms which I had personally foreseen from logical considerations.¹ That, however, which I could not foresee was the barbarity with which the Germans, in order to prevent an attack on the new position, devastated the evacuated zone. Not only did they cut the means of communication, but they destroyed villages, cellars, and even historic ruins. They threw the bodies of animals

¹ *The War of Positions*, "Retreat," pp. 168-70.

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into wells. They destroyed the springs. They cut down the fruit trees. Their object was to make of this region an uninhabitable country, a fearful desert, where for weeks and weeks no soldiers could be stationed without suffering and, consequently, no attack could be prepared. This procedure was dictated by the brutal logic of our enemies. But like many others which they had followed, it finds no place in military art as that should be understood by civilized people.

Retreat under pressure of the enemy has as its object to escape from the adversary's embrace and to reach a new position where it is possible to resist. It must not be carried out without formal orders, for the premature retreat of one unit may have a considerable effect on the rest of the position and even on the rest of the Front. If the commander of a unit finds himself too hard-pressed, he makes all the proper arrangements for resistance. He informs his immediate superior of the difficulties which he is facing and also sends word to the neighboring units. But if he does not receive the order to retire and is not sufficiently reënforced, he must remain and be killed with all his men on the spot. Such a sacrifice is often indispensable for the sake of the large units.

Retreat, more than any other operation, calls for organization and order. For that reason it

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should be planned beforehand. It is essential, however, that the commander should not make undue haste in the actual execution of the retreat. It is a critical moment when he will need more than ordinary coolness. The communications have become for the most part difficult. The telephone lines are cut. Signals are impossible. The messengers have been killed. It would take longer than usual for an order to reach the front line, even if it should get there at all. All these circumstances must be kept in mind, and the hour for the retreat fixed in such a way that all of the units shall be warned, and warned in time. The only way to be sure that orders have reached their destination is to require a receipt. In this way it is certain that no unit will be forgotten.

If the pressure of the enemy is not too great, it is best to carry out the retreat during the night, although preparing for it in the daytime. The order to retreat should indicate on what position troops should make a stand against the enemy. It should point out the mission, the objective of each unit, and the itineraries to be followed. The main roads should be reserved for the artillery and matériel.

Retreat is carried out under the protection of troops of all arms designated for the purpose. These troops sometimes have to be sacrificed

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to the last man, resisting where they are. They seek especially to deliver counter-attacks, which have all the more effect when launched at the best moment. Moreover, the artillery lays down barrages which can help materially in delaying the enemy's advance.

The infantry must at no moment be without artillery protection. To this end the artillery should always retire in echelon. The heavy pieces should leave early enough not to be captured by a swift enemy during their displacement. Once more, then, appears the necessity for echelonment in depth, for the artillery, for the infantry, and for the machine guns. The installation of the heavy pieces is a particularly long process, and for that reason it is necessary, especially when a position is in danger, to make sure that this echelonment is observed and that the position behind is furnished with a sufficient number of pieces. Artillery cannot fire while it is in movement, so that if it is all being moved at once, not only is the infantry left without protection, but the artillery is quite likely to be captured. Under these circumstances, the second position, deprived of the pieces which should help in its defence, can offer but a feeble resistance.

Although the moment for the retreat of the artillery should be chosen by the Command, a certain amount of independence may be left to

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the commanders of artillery groups or the battery commanders, for they alone are in touch with the situation at every moment. In some cases it is wise to retreat a considerable distance in order to be in position when the time comes to fire. In other cases it is necessary to keep on firing until the last moment, perhaps to sacrifice the guns, which should be put out of commission if they cannot be removed. The old feeling, that an artilleryman lost caste if his piece was captured and he was not killed with it, was highly honorable, but it is not in accord with the laws of modern war. A piece which has been of real use has fulfilled its task, and may be sacrificed. As for the men who serve it, they should save their lives in order some day to serve another piece. If they are separated from the artillery they should join the nearest body of infantry and fight side by side with it.

During the execution of the retreat the liaisons are more necessary than ever. They enable the troops to transmit important information and to help one another, and they enable the Command to make decisions.

On the other hand, all means should be employed to break up the enemy's formations and to delay his progress. Obstacles, traps, *fougades*, and mines should be placed in suitable spots. Lines of communication should be cut or destroyed.

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Since the object of the retreat is to resist in a new position, the Command should fix the limits of this position if it includes a part of the old one, and should indicate its exact location if it is at some distance. Generally, this position is already occupied by reserves of all arms. In this case the retreating troops have merely to pass through it as rapidly and in as good order as possible. They leave behind all matériel, munitions, and supplies which may be of use to the defending troops.

If no position has been organized and occupied to the rear of the evacuated one, that shows mistake or negligence. The only way to stop the retreat is to create one. This, however, cannot be done under fire from the enemy. It is difficult to fight and to create works at the same time. The best plan is, then, to retreat a considerable distance, making use of the night as much as possible, to choose a new position and to install the artillery there at once.

In either case the retreat will stop only when the enemy encounters a position furnished with artillery, and has no other alternative than to see his troops destroyed in the open country or to create a position for himself. If he chooses the second alternative, the Front is created once more.



THE RETOUR OFFENSIF

Attack near Douaumont, in the region of Verdun. Advance of a French wave

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The *retour offensif* is intended to recapture the position which has been lost. It should be carried out as soon as possible in order that the enemy may not have the time to organize the ground which he has conquered.

If the enemy does not attack the second position, it is generally because he does not feel that he is strong enough to capture it at once. The *retour offensif* is to be carried out before he is able to be reënforced. If he does attack the second position, he exhausts himself considerably and is often obliged to give up the attempt. Then is the proper moment to try a *retour offensif*.

The *retour offensif* follows the same rules as the attack on a position. In reality it is an attack in which the amount of artillery preparation has been greatly reduced, because it is necessary to act quickly, because the enemy has no works which have been established for a long time, and because the position to be attacked is well known to the attackers. It is important to take advantage of this last fact by making use of troops who have occupied the position.

If the *retour offensif* succeeds, the situation may turn to the advantage of the troops who obtain this success. The reserves attack and demoralize the enemy, throw him back on his departure position, follow him into it, and perhaps manage to carry it. In this way a result is

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obtained which might be difficult to obtain directly; it may even be the beginning of victory.

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This exposition of the different phases of the defence of a position brings back continually to my mind one of the most glorious pages in the history of this war — Verdun. Of course everything was not perfect at Verdun, especially at the beginning. There were serious faults in the organization of the defence, such as centres of resistance, isolated one from another, which expected to prohibit passage through the intervening zones by delivering a flanking fire. These “nests for bombs” were naturally attacked by the Germans and captured without being able to aid one another. Doubtless other errors were committed which cost France the life of many a brave soldier.

One thing was truly admirable in defensive battles — such as Verdun, or the Marne — that was the heroism of the French troops who, when they were told, “You must hold on!” did so, no matter what the cost. At Verdun, if the troops had not held, there would have been a catastrophe. The English army was still too small at that moment to support a great part of the weight of the war. But there remained the French soldier, always ready, whatever his age,

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whatever his native province, to meet death for the sake of his beloved country. There remained also a leader worthy to command such troops, General Pétain. His arrival at Verdun, together with that of De Castelnau, effected a magical transformation of the situation. To-day he is at the head of our armies. He has the knowledge, the experience, the wisdom, the audacity, which go to make a great general. There is a leader, indeed! We may have confidence in him for the great days to come!

VIII

OFFICERS AND SOLDIERS

LECTURE OF DECEMBER 3, 1917

SUMMARY

The feelings of a soldier.

The qualities of the commander: education; necessity of general knowledge; orders; initiative. — *The qualities of the soldier:* discipline; confidence.

The military situation in France: — The intellectual training of the officers; l'École de Guerre. — Troop officers and staff officers; their initial differences and their complete reconciliation. — Troop officers; officers of the active army; reserve officers. — Homogeneity of the body of French officers. — Comradeship in the small units. — The comradeship of arms; infantry and artillery: Honoré de Villard: infantry and aviation: Guynemer; engineers; cavalry; the services of the army.

The French troops: — The infantryman is the hero of this campaign. — His patriotic idealism. — His undying will to conquer. — His generosity towards the enemy. — His various qualities. — The example of the veterans. — *Esprit de corps.* — The love of the flag. — The sense of glory. — The pride of the wounded. — The sacrifice of life. — The dawn of a new future.

WHAT is a soldier? He is a man who is ready to give up his liberty because he recognizes that his superiors have the right to dispose of all his powers of mind and body. He is ready to sacrifice his life if that be necessary for the safety of his country. These two feelings, the spirit of discipline and the spirit of sacrifice, are the cornerstones of the military profession.

Military virtues are the same from the top

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to the bottom of the hierarchy. But the same qualities are not requisite to the same degree in the different grades. An officer must first of all know how to command, while a private's first duty is to know how to obey.

It is worth while to make a rapid examination of the general principles which permit an officer and his men to act in harmony. By studying the conduct of officers and soldiers in the course of the war, we shall be able to define the qualities which must be cultivated in an army. By studying the evolution which has taken place during the last three years in the French army, we shall be able to deduce practical measures for the army of the United States. Of course I shall not actually formulate these measures: it is the duty of the military authorities of my second mother country to adapt those ideas, which seem to them of value, to the spirit and traditions of the troops under them.

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An officer must know how to command. The first condition of being able to command is to be trained; and training does not consist, as some people imagine, in knowing a certain number of special rules of the military art: it is a result of general culture, which includes literature, science, and art. Nothing but this culture can give to

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the mind that suppleness and fineness of perception which enable one to observe, to reason, to make decisions. When a commander really knows, he is neither timid nor embarrassed. He does not have to look at a book or manual to find out what to do. He merely makes up his mind with a clear understanding of the circumstances actually present.

In war there are nothing but particular cases. It would be absurd to try to plan in advance for all possible events. A general who tried to remember how Napoleon manœuvred at Austerlitz or Jena, in order to repeat these manœuvres, would make dreadful mistakes. A subaltern who wondered what page of the Regulations would apply to the present case, would make a mistake of the same sort. The orders to be given should flow as a simple, logical result from the officer's total knowledge.

Orders should be clear, precise, and complete. They must also be given at the right moment, and in battle this moment is fugitive. The well-trained officer has the advantage of avoiding all hesitation, all vagueness, and of expressing his ideas immediately in the best form. Years ago one of our poets said: —

“ Ce que l'on conçoit bien s'énonce clairement,
Et les mots pour le dire arrivent aisément.”

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First, last, and all the time, orders should not be countermanded. An old French military proverb gives the reason in three words: —

“Ordre, contre-ordre: désordre.”

Nothing could be more true. When a body of troops have received an order, and, still more, when they have begun to execute it, they are completely disconcerted if the order is countermanded. They conclude at once that the commander is ignorant or vacillating. In the same way, orders which are too frequent and, in consequence, are useless or incomplete, produce a most unfortunate impression.

An officer who really knows, gives orders which are complete and gives them with precision. He leaves nothing undefined, and assigns to each subordinate his exact duty. When this duty has been assigned, he makes sure that it is carried out; in fact this is one of the essential parts of his responsibility, without which the best possible orders may remain ineffective.

If an order is to be well carried out, it must be practicable, and this condition also depends on the general training and the practical knowledge of the officer. An order which is perfectly logical in theory may be impossible of execution. It would produce a most unfortunate effect upon the troops and tend to cause insubordination. Under these circumstances it is the duty of the

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subordinate to inform his superior immediately of the difficulties of execution.

An order should be precise and definite. It should by no means take away from the subordinate the privilege of initiative. Initiative is, in fact, a necessary quality in every grade of the army. It enables an officer to make choice of the means of execution as soon as he knows the intentions of his commander and has received a definite assignment. It does not consist in modifying an order upon the pretext that another will produce a better result. That would be disobedience. It does, however, make it permissible to point out the difficulties involved in the execution of an order, to point out and to adopt particular means for attaining the desired end, and even to give orders when the superior has failed to do so. Initiative should be combined with knowledge and tact, but also with prudence, and should be confined to the special purpose in view. Even if at times it causes mistakes, it should still be developed in order to combat that fear of responsibility which leads to supineness. Supineness is one of the worst faults which a commander can have, for it leaves his troops a prey to the hostile designs of the enemy with no endeavor to oppose them. The excuse of having received no orders should never be admitted in such a case. The subordinate should either ask

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for orders or, if time is short, give them himself and report the fact.

The soldier must know how to obey. For that reason orders are given without explanations. In war the moment is fleeting. Time is short and must be spent in acts, not in words. Of course, a body of troops like to know the object of their endeavors. They should be told as soon as possible about them, for the soldiers of a free country will go ahead with much more enthusiasm if they know what they are trying to do. Moreover, if the commander has taken pains to set forth his general intentions, his particular orders will explain themselves. Even when the immediate end in view is not perfectly evident, a subordinate officer should yet refrain from criticism. Such criticism not only gives a very bad example to the men, but may turn to the disadvantage of the critic himself, for the reasons for an order may appear later and show the foolishness or incompetence of those who criticized it.

It is best, then, that soldiers should learn to obey passively. This is the principle that French military men have epitomized in an ironical phrase addressed to those who ask for explanations: "Obéissez sans chercher à comprendre."

If the necessity for an order does not become clear by the course of events, it is well to explain it subsequently to the troops. The next time they

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will still obey passively, but with greater confidence.

Confidence in the commander is one of the most important factors in discipline and, hence, in success. It is based upon two feelings: the respect which the soldiers have for the ability of their commander and their personal affection for him. The ability of a commander depends upon his knowledge, his energy, his courage, his thoughtfulness, and his coolness, — in a word, on all those qualities which make it possible for him to command. His personal character is shown in the uprightness of his life, his care for his soldiers, and his justice towards them. When a commander has gained the confidence of his men, he has a far greater authority over them than any which comes from his grade.

One of the surest means to acquire this confidence is, of course, the force of example. Under difficult circumstances, when the troops are worried, when they are suffering, when they are in danger, they watch their leader. They ask only to find in him the support which they need. If they see that he is calm, stoical, brave, they gather new courage and give themselves more completely to the performance of their duty. An officer cannot have a more splendid reward than to perceive that he has produced this effect upon his men.

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An officer should understand what a splendid part he can play under these circumstances. He should make use of his influence over his soldiers to obtain from them all those sacrifices which war requires. But he must always have in mind the means of lessening their sufferings and sparing their lives.

. . .

In France the military calling has always been considered the highest of all. For centuries the right to command soldiers was reserved almost exclusively to the better families. The career of arms offered a patent of nobility to those families which could show four or even fewer generations of officers. On account of these traditions, before the war, the officers were recruited almost exclusively from the most distinguished families in the country.

A man became an officer either through family tradition or personal predilection, especially in those families where, as a result of a prejudice which is now beginning to disappear, commerce and industry were looked down upon. In fact, an officer served in consequence of his ideals or his devotion to his country; he served for honor, for his pay was very small. Still, he did not care about money. The second lieutenant, who received two hundred and ten francs a month, felt

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far above a grocer who got ten thousand francs in the same time, and would never have thought of exchanging his epaulets for the desk of a merchant. It may be that this attitude of mind is changing in the present century, when a love of money is beginning to destroy many traditions. Still, it was very common before this war among our officers, who were accused by certain political parties of being undemocratic.

We should not decry shoulder straps. They have their uses. It is possible to be perfectly democratic and yet have a high opinion of the military profession. It is a mistake to try to level down a whole people by wiping out all the traditions of its history. In England and the United States many official and university ceremonies have been retained which, under certain circumstances, involve wearing the dress of past centuries. In France we keep our military traditions, which spring from our long and glorious history. The French officer has behind him a long series of gallant figures, which still inspire him: the warriors of the Crusades and those who long fought against England, now our friend, the illustrious leaders in the wars of Louis XIV, the group of officers who followed Lafayette to America, those who shared the glories of Napoleon, and those who, foot by foot, won for France Algeria and her colonial domain. Why should we try to root

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those traditions out from our soil when they foster the noblest sentiments and still constitute the glory of our race?

The officers before the war had, perhaps, a tendency to form a caste. They had so many noble and solid qualities that this small fault might well be pardoned in them. It is fair to analyze them now, for they belong to history. Many are dead or mutilated, and the others will be profoundly changed at the end of the long tragedy.

Officers generally had a special cast of mind, and confined themselves to the practice of their profession. They forgot that future wars would make use of all the human and material forces of the nation. They regretted to see some of their number take part in the work of the universities — study, discuss, and write. They were ready to look down on these men as non-military, without ever taking account of what they had really done in their profession.

Those officers who wished to rise above the mass went to the *École de Guerre*, which was intended to furnish officers for the staff. It was a necessity for their advancement. Those who seemed to dread the thankless tasks involved, the prospect of further years of schooling, were made to see that this was the only safe way. The preparation for the entrance examination

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had the advantage of making many go to work who perhaps were little used to effort without a tangible object and a definite plan. The sojourn subsequently with the different arms completed these studies. Finally, a stay of two years at the school enabled the pupils to acquire a method of work, to clarify their ideas, and to learn those methods of analysis and synthesis, necessary for the proper drawing-up of orders and reports. In a word, the *École de Guerre* developed the general culture and the professional knowledge of those who went there. Unfortunately, it also developed two faults: in most cases a belief in the infallibility of the doctrines learned; and, in some cases, a pretentious and tactless feeling of self-satisfaction. The prejudice which existed against the school, whose usefulness should not be forgotten, is accounted for by these faults.

In the course of the war the officers of the line and the staff officers found themselves very differently placed, especially during the first year. The officers of the line, exposed in the trenches to shells, to bullets, and to the inclemency of the weather, fought day and night with the enemy, with the cold, with the rain, and mud, and insects. The staff officers were, together with the generals, stationed in the rear in farmhouses or *châteaux*, safe from projectiles, with good fires and beds. This difference

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was inherent in the conditions of war and did not cause grumbling on the part of the officers of the line. But when they received impracticable orders relating to certain works or certain operations, they became indignant, and vented their indignation, not on the commanders who were responsible for these mistakes, but upon the staff officers whose duty it was to transmit these orders and to see that they were carried out. There thus sprang up during the first year of the war a serious disagreement between the officers of the staff and the officers of the line. What made it worse was that the staff officers, who did not have to risk their lives, had also the best chance for rapid promotion.

Little by little this state of affairs came to the knowledge of the High Command, which took measures to alter it. The staff officers were required to pass a certain number of months with the troops and behaved admirably. Unfortunately, like all newcomers in the trenches, they often fell victim to their inexperience in the practice of this war. But they won, by their personal courage and their enthusiasm, the warm affection of the units which they were called on to command. Most of them have now stayed long enough with the troops to raise them above all criticism.

The officers of the line were divided at the

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beginning of the campaign into two categories: officers of the active army and reserve officers. The officers of the active army were graduates of Saint-Cyr, a school for infantry or cavalry officers; of the École Polytechnique and Fontainebleau, schools for artillery and engineer officers; of Saint-Maixent, a school for infantry N.C.O.'s; of Versailles, a corresponding school for artillery; and of Saumur, for cavalry. Those who came from the schools for N.C.O.'s had usually less general culture and professional knowledge and, since they became officers at a more advanced age, their prospects for the future were not so good. But all were animated with the highest feelings. They showed magnificent devotion in the accomplishment of their daily tasks.

These tasks were sometimes misunderstood by a part of the nation, infected with pacifist ideas and convinced of the uselessness of standing armies. But so soon as the war broke out, every Frenchman recognized the splendid qualities of these men and bestowed on them the praise which they richly deserved. These officers were the first to die fighting bravely. Their blood paid the price for that experience of modern war which should to-day save many lives. We must never forget it. With the solid and devoted band of professional officers who are to-day in the American army, a body of troops can enter

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the war and be certain of being well led. For they have a quality which neither the greatest intelligence nor the most complete theoretical knowledge nor the most brilliant courage can replace, namely, experience of command.

The reserve officers came in time of peace, at long intervals, to serve for a few weeks in their regiments. When they had completed their service in the active army, they had a certain amount of experience, but not always in exercising the actual command which would be theirs in future. The reserve captain or lieutenant who had completed his service as a private or an N.C.O. had still to learn the duties of his proper grade, which is by no means easy to do in a few weeks. These officers, whose willingness and devotion were very great, had frequently the chagrin of seeing their efforts misunderstood by censorious comrades of the active army. But from the very first days of the war they won admiration on all hands by their self-denial for their country. They showed themselves the equals of their comrades of the active army, quite as ready to teach by example, to lead their men, and to give their lives. Their conduct was all the more commendable, in that they had been suddenly snatched from their homes and had not had the chance to realize fully what the necessary sacrifice would be.

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They made this sacrifice with a simplicity and an enthusiasm above all praise.

Little by little they acquired the experience which they lacked at the start. After the first year of the war many of them were put in command of companies as a result of vacancies in the ranks. Now, after three years of war, during which they have often fulfilled the most thankless and dangerous tasks, no further difference should be made between them and the officers of the active army. As a matter of fact, for the most part, they have spent their time in fighting units, because it was hard for them to gain access to the staff. Nevertheless, they are now capable of rendering good service in the latter department, and, indeed, they are being admitted thereto. There are also new laws admitting them to the ranks of the active army and permitting them to win their promotions when they have given proof of their worth and courage. It is simple justice.

In truth, there are among these officers men of high intelligence, of whom our military organization, based upon the needs of peace times, does not yet take full advantage; but gradually in the course of the war each man will find his rightful place.

At the present moment the body of French officers has acquired perfect homogeneity. This

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homogeneity exists, not only among the officers of the same regiment or of the same arm, but among those of the whole army. After seeing trying days in the trenches and bloody days of battle where the different arms and the different services work together, the officers have learned the importance of mutual support for success. Little by little they have renounced an injurious particularism, which sprang from foolish rivalries and ended in disregard of the general interest.

A commander of a small unit, more than any other, is forced by circumstances and by the necessity of maintaining his ascendancy, to live in the midst of his soldiers. When these latter are exposed to bad weather, he must stay with them and not seek refuge in a comfortable shelter. When they are insufficiently fed, he must share their privations and not hunt additional supplies for himself. When they are downcast or discouraged, he must show cheerfulness and confidence in victory. A captain is a real father to the soldiers under his orders. He must look after their welfare, both material and moral, know them individually, take part in their anxieties and their pleasures, recompense them impartially, keep them always in the bonds of discipline, and restrain them from waste. These functions call for care and effort at every moment. The officers

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of the French army have fulfilled them with a tact and intelligence which have won them the boundless affection of their soldiers.

The spirit of comradeship between the officers of a company, battalion, or regiment is established with the same facility as between the officers and the soldiers. The reunions in the villages in the rear, the improvised mess, — where the officers seated round a rickety table celebrate, after the battle, by the light of primitive candles, the good fortune of one of their number in winning promotion or the cross of the Legion of Honor, — have helped greatly by their rustic simplicity to cement this affection.

That comradeship between the different arms which has brought homogeneity, took a long time to establish. The infantry officers, by their cruel sufferings and their heavy losses, were sorely embittered against the officers of the other arms who suffered less than they. When anything went wrong in one sector, they had a tendency to say that the artillerymen and the aviators had not done everything possible and had lost interest in them. In the same way the artillerymen and the aviators, at some distance from the first line, did not always appreciate the critical conditions in which the infantry found themselves and were tempted to consider them nervous and timorous.



THE FAMOUS MILL OF LANGEMARCK NEAR YPRES IN 1914
OFTEN TAKEN AND RETAKEN



THE CHURCH OF ST. JULIEN NEAR YPRES IN APRIL, 1915

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I can show by examples better than by any theoretical discussion what efforts were needed to root out this particularism from the army. I will take some from the letters written to me by my stepfather, Honoré de Villard, one of the first to demand the development of liaison between the artillery and the infantry.

He had devised a method of locating the enemy's batteries by sound, since adopted by General Headquarters for all our armies. One of his superiors in the artillery had urged him to suppress, in his description of the method, the passage in which he said the object must be to protect the infantry in the exposed trenches. In fact, he received from the general commanding the army corps a letter of congratulation, dated March 29, 1915, in which it was said that his method made it possible to determine "the distance of the German pieces which are firing on our batteries." Now, in his own eyes, as he often wrote to me, the principal use of the method was to spare losses to our infantry, by silencing the enemy's batteries that were firing at them.

In the same way he wrote to me, April 13, 1915: "We must make every effort to establish a better liaison between the infantry and the artillery. Two months and a half ago I made a report to the general commanding the artillery upon this subject. I know that this report was com-

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municated to my new colonel. But I fear that it did not have the necessary success, owing to that prejudicial particularism with which the different arms have surrounded themselves."

De Villard himself was devoted body and soul to his comrades in the infantry and wished to save them from the fire of the enemy's artillery. He wrote to me June 23, 1915: "The Germans are out of range of our cannon, and fire almost exclusively upon our trenches. The need for long-range artillery is being felt. Moreover, in my opinion, we should greatly shorten the period of preparation for an attack, so as not to leave our infantry for so long a time a prey to the enemy's fire, in trenches which are easy targets and necessarily attract shells. It is sad to see so many infantrymen fall, while so few artillerymen are hit. What is still more sad is that this produces in the infantry bitter reflections, not only among the troops, but even among the officers. All this is no help towards the problem of liaison, which will be much more easily solved by friendly relations than by any regulations."

He noted sadly that the particularism which existed among our artillerymen was no less pronounced than that of the infantry. A few days later, the 2d of July, he observed an incident that showed the recriminations of the infantry against the artillery were found even in the higher

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grades of the hierarchy. He told me, in his letter of the 6th of July, how the infantry colonel commanding the sector had accused a battery of coming into action too late and of not firing sufficiently. De Villard then showed me how the captain of the battery had done his whole duty and in fact had even greatly exceeded his allotted supply of munitions, and added: "It's all very sad. We dispute in presence of the enemy, instead of trying to aid one another. What we lack is not liaison, but mutual understanding and good-will. The complaints of the officers have an unfortunate recoil upon the men. For that reason I am asking for a period of service with the infantry in the first line in the regiment of that colonel who has been accusing the artillery. I shall thus be able to give an example of harmony. We must absolutely put an end to these childish squabbles. If it costs me my life, no one will suffer but myself and it may help towards the good of all."

He did not obtain permission to serve in the infantry, but he had the excellent idea of inviting to his improvised mess, from time to time, officers of infantry, and of establishing the desired liaison in this way. "I am anxious," he wrote to me, in describing this happy solution, "that we should see clearly that each is doing what he can."

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This conviction was brought home by his death, which came just when he was trying to protect the infantry from the fire of his batteries. The proof of the results which come from such devotion can be seen in the letter from an infantry officer who had seen him at his work :—

“We are losing a noble military figure. It is a great loss for the artillery, for the army, and for France. They must be heartbroken, those brave men from the Jura in his battalion, who were so fond of their commander and who often said, ‘The major! Ah! We have confidence in him! He is a real artilleryman!’ It is not for me to tell you what eminent services M. de Villard rendered to my division. In the course of the trips which he made in the first-line trenches, he had always some friendly words or proofs of interest to maintain the morale of my dear infantrymen. He loved the infantrymen, because he saw how they suffered. He found a glorious death in seeking to lessen their sufferings and to spare their lives for France.”

These typical details make it possible to understand how the intimacy and the affection between the artillery and the infantry, which did not exist at the beginning of the war, have been developed, and how to-day they facilitate in great measure their collaboration on the field of battle.

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Misunderstandings of the same nature existed at the beginning of the war between the infantry and the aviation. When they were not risking their lives in the air, the aviators, youthful and thoughtless, made a point of leading a happy life, behind the Front, or in Paris. The infantrymen, usually tied to their trenches, were shocked by these youthful manifestations, and rushed to the conclusion that the aviators were amusing themselves instead of giving their attention to aerial observation, to combat, and to adjusting the artillery fire. But, little by little, they found out what the life of the aviators really was. Perhaps a few of the latter, and those the ones that did the least, felt the need of amusing themselves ostentatiously; but the majority, and especially the better ones, led a life whose rigid austerity and heroic devotion are too little understood. Saving their strength for the excursions which they must take at any moment in all weathers, risking their lives every time they mount into their planes, they highly deserve the esteem and affection which to-day they receive.

One name personifies the whole legion of the heroes of the air — Guynemer. This boy of twenty-three, with a feeble and delicate body, was possessed of an extraordinary energy. In twenty-five months of campaign, he was mentioned twenty-seven times in orders and had

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fifty-four officially counted victories to his credit, a number which would probably reach one hundred if all his successes could have been verified. He had belonged to Squadron No. 3, called the "Squadron of the Storks," which was founded in 1915, with ten pilots, and at the end of October, 1917, counted twenty-two killed or missing and twenty-three wounded. His renown has been perpetuated by a memorial at the Pantheon. The Chamber of Deputies voted unanimously to inscribe his name in this temple reserved for the great men of our land as "a symbol of the aspirations and enthusiasm of the army and of the nation."

The reasons for this decision are even better seen in the letter which Major Brocard, a friend of Guynemer, wrote to Deputy Lasies: —

"Guynemer had the qualities which are characteristic of the land which he so bravely defended — tenacity, perseverance and effort, carelessness of danger, united with a most generous heart. His short life knew neither bitterness nor suffering nor disillusionment. From the Lycée, where he learned the history of France and which he left only to add a page to that history, he went directly to the war, his eyes formally fixed on the goal, driven by some mysterious force which I respected as one respects death or genius.

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"The poor boy fell facing the enemy, struck by a bullet in the head in the midst of his triumph. A few days before he had sworn that the Germans would never take him alive.

"Of course his heroic fall is no more glorious than the death of the artilleryman who falls beside his piece, of the infantryman struck down in the assault, or the more poignant agony of the soldier swallowed up in the mud. But for the last two years we all saw him above our heads, outlined in every sky, under the brightest sunshine or the most lowering storm, bearing on his wings part of our dreams, of our faith in success, and of the confidence and hope of our hearts.

"It was for the engineers, the artillerymen, and the infantrymen that he fought with all the violence of his hate, all the audacity of his youth, all the joy of his triumphs. He knew that the struggle would one day prove fatal, but he had the consciousness that with the wings of his bird of war, he saved the lives of thousands. He saw other fighters grow up in his image, and he remained faithful to the sacrifice to which he had consecrated himself in advance, and to which he looked forward with calmness."

It is impossible to find more eloquent terms to express the magnificent devotion of the aviation to the other arms. It encounters risks for them and can expect no services in return. In view

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of the countless sacrifices, like those of Guynemer, the prejudices which existed for a time against the aviators have fallen away and given place to the most affectionate esteem.

The engineers, whose devotion has been magnificent throughout the whole war, and especially during the first months, have not been criticized in the same way as have the other arms. They have thus been avenged for the criticisms which were directed against them a few years ago, when the partisans of the war of movement spoke of the uselessness of field works, which could only lower the spirit of the infantry.

The cavalry, on the other hand, has been the object of a good deal of remark on account of its uselessness for the last three years. Many of its officers have passed over to the infantry and have given striking proof of their intelligence and courage. Others have had occasion to show themselves excellent foot soldiers in the regiments of dismounted cavalry. They may no longer hope for their arm the varied and brilliant rôle which it formerly fulfilled, but in the glorious days of the pursuit they will have their chance to play an important part and will forget the years of waiting. They certainly deserve pity, and we must be careful not to speak sarcastically of them, for they suffer deeply in their *amour-propre* and their patriotism for not being

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able to take that part in the war which they had dreamed.

As for the auxiliary services of the army, from the medical corps, which is often exposed in the first line, to the railway service, which during a period of active operations is terribly overworked, the fighting arms now understand their immense importance. No one who to-day enters these services is the subject of unfavorable comment, as was the case at the beginning of the war. The reason is that each man is fitted into his proper place. The younger men have joined the units on the Front; the older or less vigorous are assigned to safer tasks. This equitable employment of the capacity of each has greatly helped to abolish rivalry and particularism. It has established the remarkable unanimity which to-day characterizes the officers of the French army.

. . .

It would take too long to study the French army in all its details and its countless specialties from the front to the rear. In order to have an idea of the troops, their feelings, and their idealism, it is sufficient to observe the fighting units, that is to say, those who occupy the trenches, assault the enemy, shed their blood. They speak little, but they have the noblest feel-

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ings and are proud of their sacrifice, jealous of their reputation, and very sensitive to indifference or injustice. They are typified by that arm which has remained more than ever the "queen of battles" — the infantry.

The infantryman has remained the hero of this war. Young or old, he has shown from the very beginning magnificent dash, admirable bravery, and boundless self-abnegation. The soldiers of the initial campaign are largely dead or mutilated; only a few have escaped by miracle from death, or have returned to the Front after convalescing from their wounds. But those who have replaced them have the same spirit. It is by seeing multitudes of men continually renewed and always ready for sacrifice that we learn the grandeur of the French race which can furnish heroes without number.

The certainty of being hit one day or another is in the mind of every infantryman, but does not dampen his enthusiasm. The man who has already dedicated his life finds in the thought of his sacrifice a stronger stimulant. The physical suffering which he undergoes, the risks which he runs, the anxiety and the regrets to which he is a prey through his affections — these all become for him sources of secret satisfaction, since "it is for France." These words, simple and sublime, are on the lips of all who suffer, all who are at



A GENERAL'S COMMAND POST IN JULY, 1915



TELEPHONE MEN REPAIRING A LINE AFTER A FRENCH ADVANCE
AUGUST, 1917

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the point of death, and are in the hearts of all who fight.

The noble exaltation which inspires the soldiers is found in their letters, in their intimate diaries, in their mutual confidences, more or less diluted, and in more or less articulate form, according to the character of the individual. Phrases which were picked up by a journalist from the letters of a dead man, words which were immortalized by a mention in orders, these have been spoken or written by thousands in almost the same form. They are not only the proof of individual courage, but the reflection of the heroism of all.

Frequently the simple language in which a poor peasant expresses his thought is more touching than the formal style of the man of education. How many times have I seen the pitiful relics taken from those who had sacrificed their lives: letters begun and never finished, letters received and treasured, diaries, last instructions! Before tying up the packet and writing thereon the name of one soon to weep for the loss of a son, a husband, or a brother, I saw that the brave soldier, after speaking of the coming harvest in his fields, his sheep or his cows, begged his loved ones, in words of splendid simplicity, not to mourn if his death were needed for the welfare of his country.

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Patriotic feeling is often stimulated by the thought that France did not wish the war, but that she will "see it through." I was much surprised to discover that men of little education, little general culture, who seldom read the papers, had yet felt deeply the insults and threats which their country had for some years suffered at the hands of Germany. I saw that, true lovers of peace, they had suffered these unacknowledged humiliations in silence, but that their native pride had been suddenly aroused, and that their long-smouldering resentment had burst into flame when the German mobilization made a rupture inevitable. They declared that they were fighting to insure to their children the benefits of peace, that they wanted to put Germany in such a situation that in the future she could do no harm, and they were determined to go through "to the bitter end."

The cruel losses of loved ones and of property merely stimulated this feeling within them. The atrocities of every sort committed by the Germans increased their desire for an avenging justice, but never suggested to them analogous acts of cruelty as reprisals. They are anxious to settle accounts, but not by the old formula: an eye for an eye, a tooth for a tooth. French soldiers would be incapable of assassinating a prisoner, of shooting the innocent, of maltreating and kill-

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ing women and children, of reducing families to slavery, or of destroying without motive triumphs of art. No. What they wish is punishment for the guilty. First of all, the Kaiser and the military party, as being responsible for the war. Then, the individual criminals, whether generals or private soldiers, who have committed outrageous acts in Belgium, in France, and in every land where the German armies have penetrated. The soldiers will demand this justice before the tribunal of civilized nations which will be called upon to judge the crimes.

The enthusiasm of the troops is more conscious, more energetic, and more the result of reflection than it was at the beginning of the war. It has no longer the exuberant form which was seen in the men called to the colors, still in citizens' dress, collected at the Gare de l'Est to join their regiments, or in the fully equipped soldiers whom the concentration trains carried towards the frontier in flower-decked cars resounding with song. Since the Battle of the Marne, the men have understood that it was a question of saving France, that this task called for sacrifice of every sort. Songs have given place to thoughtful silence. The hard and monotonous life of the trenches has had the effect of modifying their characters. They have curbed the national impetuosity which drove them forward in the wars

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of former times with fixed bayonets and an irresistible dash. They have learned by bloody experience that such dash has merely the effect of thinning their ranks by useless slaughter.

Here we recognize the essential qualities of the French peasant, bred to slow and laborious toil, his harvest always threatened by disaster, accustomed to the fight with the elements, — qualities which have become characteristic of the entire body of our fighting men: patience, resignation, obstinacy. There are also the qualities learned with age, taught to the young soldiers by those of the older classes, grouped in the same unit: wisdom, firmness, obedience.

Example is contagious. The older officers gave it to the younger, and the younger to the N.C.O.'s. Such example has cost many lives; but it was indispensable if the spirit of sacrifice was to flourish throughout the army. I often remember these lines of my stepfather, dated March 11, 1915, in the letter in which he consoled me for the death of one of my officers about which I had written to him: —

“It is certainly very sad to lose the best of the officers. No matter what people ordinarily believe, a good leader of men cannot be improvised in a few days, because courage is not enough, even though it is indispensable. With our countless effectives, we have greater need than ever of

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a large number of experienced officers. Of course, it is difficult, on the one hand, to avoid loss, and on the other to make sure that the officers shall give the *necessary example*. Victory will go to that side best able to satisfy these two opposing conditions."

The older officers and the older soldiers, who went through their term of military training at a time when discipline was stricter, and the feeling of authority more firmly fixed, contributed a solid foundation, on which the new national army was built up. It was in part owing to them that the spirits of our troops have shown no sign of faltering. A word, a gesture, was enough to remind the younger men that they, "the old stagers," were also suffering and in pain. The younger classes and the men not accustomed to army life acquired little by little the sentiment of discipline and the important idea of the military hierarchy which is derived therefrom.

Certain regiments or battalions have acquired these sentiments more completely thanks to their *esprit de corps*. Indeed, some corps possess traditions which are so powerful that the frequently renewed contingents, which are incorporated in their ranks, become impregnated therewith and so maintain their distinctive quality. Examples may be found in men of the Foreign Legion, the infantrymen of the Division de Fer, the Chas-

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seurs à Pied, the Zouaves, and the Tirailleurs. Their greatest desire is to honor the glorious corps in which they are enrolled and to go heroically to death to show themselves worthy of the reputation of their regiment.

These noble sentiments are similar to those which are felt with regard to the flag, and which you know so well in America. I have often noticed how men's hearts, on this side of the water as on the other, are moved by the sight of this emblem of their country. And now that I have lived with Americans, now that I have worked with their army in this particularly solemn time of war, I also feel profoundly moved when I see the Stars and Stripes pass before me. I remember a review of the Harvard Regiment, which my comrade in arms, Major James A. Shannon, arranged with a peculiar delicacy in honor of our French national fête on the 14th of July last. At the march-past, the flags of our two countries were side by side. When they arrived in front of me, a gust of wind entwined their folds and, for a moment, I saw the Stars and Stripes in close embrace with the Tricolor of my country. This unexpected and touching symbol of the Franco-American friendship, more intimate than ever since the blood of our two peoples was to be shed over there in a common cause, moved me deeply. As I saluted the two emblems my eyes filled with

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tears. Of course, in reality these pieces of bunting are small things. Yet every citizen of our two republics will go to death for the ideas which they represent.

The French military song which successive generations have sung in time of war, begins as follows: —

“Mourir pour la Patrie

C'est le sort le plus beau, le plus digne d'envie . . .”

This popular song expresses exactly the feeling of the masses, all ready to give their lives. It also explains the pride of the wounded and the mutilated who are happy to have shed their blood for their country. They are eager to be congratulated and honored for their soldierly devotion to their country. They refuse to be commiserated. I have been really shocked sometimes by the point of view of people who, lacking a developed patriotic sense, have looked at my arm support and said, “Too bad.” Not a bit of it! It is n't too bad! In fact, I said one day to a lady who seemed sorry for me, “I would n't sell this wound for \$100,000.” Imagine what she replied! “Of course, with that wound you are certain not to have to go back to the Front.”

Not to go back to the Front! That's the worst punishment that can be inflicted on a wounded man whose heart really beats. Why don't people understand this? How can they thus bruise a feel-

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ing which is shared by every man whose dearest hope is to bear arms once more? No man has ever done enough for his country. He owes her everything, to the last drop of his blood. And the man who is mutilated, and even disfigured, is really beautified by his willing sacrifice. This was expressed in a pretty picture which I recently saw in the magazine, "Town and Country." A young girl stands in front of her wounded sweetheart whose face is covered with bandages, and is saying to him, "I love you all the more now." The picture and the sentiment are the expression of a delicate comprehension of womanly kindness and patriotic affection for a hero.

Indeed, they deserve this kindness and affection, the mutilated and the blind, for whom so much has been done, especially in America. Too much cannot be done to improve the lot of those men who have sacrificed themselves for the great principles for which we are fighting.

But there are others of whom I often think. I think of the countless soldiers who have died obscurely at a turn in the road, in a furrow in the field, in an isolated trench, in a shell hole, when none might know their heroism, and not even a mention in orders might come to bring their families the consolation of an heroic memory. These splendid men, the peasants of France, whom neither military inheritance, nor moral



IN A GERMAN BOYAU AT THE LABYRINTH. A RUNNER ESTABLISHING THE LIAISON DURING THE ATTACK. BODY OF A GERMAN IN THE FOREGROUND BATTLE OF ARTOIS, MAY 10, 1915



THE WOUNDED MUST LEAVE THE BOYAUX CLEAR FOR THE ADVANCE MAJOR AZAN, IN THE GERMAN POSITION AT THE LABYRINTH, ON THE SLOPE BY THE SIDE OF THE ROAD FROM BETHUNE TO ARRAS BATTLE OF ARTOIS, MAY 10, 1915

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development through education, nor intellectual growth through instruction, nor the practice of the profession of arms, had prepared for such a sacrifice, have yet endured it with a noble simplicity and have ended often in the common ditch without so much as a wooden cross to carry their names.

Oh, my dear soldiers, soldiers of peace-times, whom I led singing along the highways and across the fields of France, soldiers of war-time whose sufferings and dangers and hopes and joys I have shared, to-day you are in the grave! How often, without your knowing it, have I looked at you with affection, with admiration, when your frank, clear eyes were fixed on me in that splendid attitude of the French military salute where the soldier seems to be saying to his commander, "I am yours, count on me." If I survive this war it is my wish to tell the future generations how truly great and fine you have been. I should like to see a splendid monument erected in your memory, so large that all the cannon which we shall take from the Germans in the day of victory will not furnish the metal needed for the construction. I weep for you. I love you.

No, I do not weep for you. I have no right to do so, any more than I weep for the men of my family or my dearest friends. You have done your duty. A survivor may have but one regret,

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that is, that he has not done as much as you for the mother country.

The blood which you have shed will prepare the ground for new generations, more beautiful, more strong, and more moral, than any we have yet known. And from the midst of these countless tombs there will spring up a new race, more truly imbued with feelings of goodness, justice, and humanity. The civilized nations will find a means to unite themselves in a new society, which will prevent the repetition of all the horrors we have seen.

Of course, we must not cherish the Utopian idea that war will disappear from the face of the earth. One might as well expect that crime and robbery would disappear from among men. But a strongly organized international police will be able to limit future conflicts and to lessen their necessary hardships. Let us have confidence in the future of our civilization which has been won as a result of centuries of effort. We must hope that the war which is going on to-day, instead of throwing it back, will advance it to a new stage. When that time comes, the motto of the liberated nations may be, in memory of the sacrifices made by France, that which is seen on the flag and on the monuments of my country: —

Liberty, Equality, Fraternity.

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Reprinted from *The War of Positions*

By Lieut. Colonel Paul Azan (Harvard University Press
Cambridge, 1917)

With additions and corrections

Accessory defences (*défenses accessoires*): Material obstacles such as barbed-wire entanglements, chevaux-de-frise, pitfalls, etc., for the purpose of obstructing the approach to temporary or permanent fortification. The word "obstacles" has been frequently employed in English for this purpose, but should be avoided, since *obstacle* in military French has a totally different meaning.

Aménagement (*aménagement*): Preparation of a terrain or of a position for the purpose of a military operation. It includes the construction of all sorts of works, the bringing-up and installation of matériel, the organization of communications, etc.

Artillery:

- (a) **Field artillery** (*artillerie de campagne — A. C.*): In this book this term is used in its French sense. In France field artillery includes only the smaller calibres such as the 75 (3-inch), the 80 (3.2-inch) and the 90 (3.6-inch), which correspond to what is called "light artillery" in the United States. The larger calibres, including the 95 (3.8-inch) and upwards, are classed in France with the heavy artillery; but in the United States some of these larger calibres are included, together with the light artillery, in the term "field artillery."
- (b) **Heavy artillery** (*artillerie lourde — A. L.*): In this book this term has also been used in its French sense. In France heavy artillery includes the 95 (3.8-inch) and upwards; it is subdivided into heavy artillery of medium calibre, up to the 155 (6-inch), and heavy artillery of larger calibre, from the 155 upwards.
- (c) **Light artillery** (in the United States) (*artillerie légère*): This term no longer exists in France, and it is not used in this book. The American light artillery is the same as the French field artillery. (See under "Field Artillery.")

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- (d) **Trench artillery** (*artillerie de tranchée* — *A. T.*): Includes all ballistic weapons, bomb-throwers and mortars of all calibres and of all models which are set up in trenches and served by artillerists called trench mortar-men.
- (e) **Assaulting artillery** (*artillerie d'assaut*): Armored motors, such as tanks, carrying cannon of small calibres and machine guns, which precede or accompany the infantry in an assault, and may be utilized in the continuation of the attack.
- (f) **Light motor artillery** (*artillerie légère automobile*): Armored cars, carrying cannon of small calibres and machine guns, capable of rapid motion, and utilized in pursuit.
- (g) **Fixed artillery** (*artillerie de position*): Artillery not regularly provided with means of transportation, and intended to remain at the same emplacements until a change of position is recognized to be advisable.

Attrition (*usure*): Indicating wastage of men and of matériel, and deterioration of morale.

Automatic machine rifle (*fusil mitrailleur*): An automatic rifle which works by a long recoil of the barrel, and is loaded with semi-circular clips containing twenty cartridges each. It weighs about eighteen pounds and is served by a marksman and two loaders. The term "French automatic rifle," formerly used to designate the *fusil mitrailleur*, is no longer employed in this sense, because a regular automatic rifle has been invented and is now in use in France. The term "automatic rifle" is henceforth reserved for this weapon. On the other hand, care must be taken not to confuse the automatic machine rifle with the machine gun.

Barrage (*barrage*): A wide curtain of fire, formed usually by shells, but also sometimes by projectiles shot by infantry weapons, for the purpose of creating an impassable zone in front of friendly troops.

A barrage may be either defensive or offensive.

A defensive artillery barrage is delivered at a moment's notice, in order to stop an attack, a counter-attack, or a *retour offensif* by enemy troops. An offensive artillery barrage is a moving barrage, which precedes by the shortest possible distance the attacking infantry of the same side that delivers it, and advances at the same rate with that infantry.

Battle map (*plan directeur*): Detailed maps, on the French scales of $\frac{1}{200000}$, $\frac{1}{100000}$ and $\frac{1}{50000}$, giving the fullest and most minute information obtainable in regard to the enemy's trenches and organiza-

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tion. These maps may show only the enemy's trenches, or they may show those of both sides; in this latter case, they are not given to commanders of lower rank than majors, and must never be taken up into the first line.

Formerly these battle maps were called "firing maps" (*plans directeurs du tir*), and were made for the use of the artillery. But now that the necessity of having detailed maps for all arms of the service, for the staffs, and for officers of all ranks has become generally recognized, these battle maps have developed rapidly, and their use has been greatly extended.

American officers of all ranks should familiarize themselves with these French battle maps, and with the French scales.

Boyau (*boyau*): A ditch used for circulation between the trenches and the rear in the dangerous zone. The boyaux run in a direction generally perpendicular to the front, and are used solely for circulation, while trenches are used for combat and run in a direction generally parallel to the front. The English call these boyaux "communication trenches," which is likely to cause confusion. The word *boyau* is in accord with the French usage. To avoid errors which might result from the adoption of the English terminology, the term "communication trenches" has been kept out of this book. For the same reason the term "communicating trenches," which has been sometimes employed to designate "doubling trenches" (not boyaux) should also be avoided.

Camouflage (*camouflage*): Any means of concealment of works, batteries, matériel, roads, trenches, troops, or any other implement of warfare.

Command (*commandement*): Designates in a general way leaders of high rank whose duty it is to make decisions and to give orders; it also includes their staffs.

High Command (*Haut Commandement*): Designates leaders of the highest rank such as the Commander-in-Chief, Generals of army groups and of armies.

Command-post (*poste de commandement*): Place where a commander places himself, either in the trenches (organized shelter) or during the course of the combat (improvised shelter).

In current usage the word "station" is sometimes employed, together with the rank of the commander occupying it: e.g., "Colonel's station."

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Counter-attack (*contre-attaque*): Partial attack directed against an attacking body of hostile troops for the purpose of preventing its advance.

Dépôt (*dépôt*): Place where provisions, water, ammunition, or matériel can be set down. In zones exposed to artillery fire it is a shelter or a wide space where munitions are spread out so as to escape the danger of destruction by enemy airplanes.

In the French military vocabulary the word has another meaning, namely, the unit comprising available troops who are awaiting their departure for the front, as, e.g., *dépôts des régiments* (in the cities far behind the lines) or *dépôt divisionnaire* (near the front).

Echelon, *verb* (*échelonner*): To arrange a body of troops in echelons, that is to say, to divide it into two or more portions placed one behind the other.

Echelon, *noun* (*échelon*):

1. A portion of a body of troops arranged in echelons. In the case of artillery, "to move by echelons" means to move the echeloned portions one after another in such a way that the rearmost passes in front of the foremost.
2. In a special sense a portion stationed behind and to the right (or left) of another portion of the same body of troops. This is in fact the usual significance of the word in English. "To retreat by echelons" means, in the case of infantry, to move back the different portions one after another in such a way that one of them is placed behind and to the right (or left) of the one adjacent to it and under its protection.
3. In French the word *échelon* has also several other meanings:
 - (a) *Échelon de combat* (artillery) signifies combat train;
 - (b) *Échelon*, in the case of a machine-gun company, designates a portion of that company consisting of the means of transport for those guns and their ammunition which are to go directly to the firing line.

Echelonment (*échelonnement*): Arrangement by which a body of troops is divided into echelons.

Effectives (*effectifs*): Number of men (officers, N.C.O.'s, and soldiers) in a body of troops.

Emplacement (*emplacement*): Point or portion of the ground which is or can be utilized to install a weapon, an implement, an organ

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of command, matériel, or a body of troops. The "location" is the topographical determination of the emplacement.

Enfilading fire (*tir d'enfilade*): A fire which catches a linear objective longitudinally, whether from the side or from the front; end-on fire.

Fascines (*fascines*): Faggots about eight feet long used in field fortifications.

Field works (*ouvrages de campagne*): In contrast to permanent fortifications.

Flanking fire (*tir d'écharpe*): With reference to an element of a front to be defended, a fire whose object is to catch an assaulting enemy on the flank.

Fougade (*fougasse*): Buried charges of powder or melinite sometimes covered over with stones and exploded by an electric current or by a detonating fuse.

French automatic rifle: Term at first used to indicate the automatic machine rifle, *q.v.*, in contrast to the regular automatic rifle. It has now been definitively supplanted by the term "automatic machine rifle."

Gabion (*gabion*): Cylindrical basket without a bottom, composed of branches tied around stakes and filled with earth, sand, or gravel; utilized in field fortifications.

Group (*groupement*, — *d'artillerie*): The word *groupe* in French designates the regular artillery unit corresponding to the American artillery battalion. The group (*groupement*), on the other hand is a temporary conjunction of different units, — usually of different calibres, — as, for example, a battalion of field artillery and a battery of heavy artillery.

Guide-plan: Phrase sometimes used to indicate *plan directeur*. See under **Battle map**.

Indicative (*indicatif*, — *aviation*): Prearranged signal by means of which an airplane or balloon can either call the station on the ground with which it wishes to communicate (by wireless or by an electric flash light on board) or can make itself known by an identifying cartridge with one or several flashes.

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Listening post (*poste d'écoute*): Post situated in front of the first line trench for observing and listening to the movements of the enemy.

Location by sound (*repérage par le son*): Method by which it is possible to determine, from the sound of the cannon, the location of the batteries where they are. Posts furnished with specialized instruments and a specially trained personnel (called *posts for location by sound*), are established for this purpose.

Observation post (*poste d'observation*): Position selected to enable commanders of every rank to observe the enemy or the terrain. It should be close to the command-post and consequently determines the choice of the latter in the case of an advance; it is organized as completely as possible, but lacks the extensive equipment of an observing station.

Observing station (*observatoire*): A construction specially organized for purposes of observation in a place selected because of its topographical location and the views it commands. Observing stations are provided with a special personnel and a special outfit; they are carefully concealed from the sight of the enemy and protected against bombardments. There are observing stations for the Command and observing stations for the artillery.

The French word *observatoire* is also applied to airplanes and balloons. One speaks of aerial *observatoires* in contrast to those on the ground.

Radio officer (*officier radiotélégraphiste*): Officer in charge of the radio service in the army and army corps staffs. See **Receiving officer**.

Receiving officer (*officier d'antenne*): Artillery officer who makes a specialty of receiving the wireless messages sent by the adjusting airplanes. The term "radio officer" may be reserved to designate the officers in charge of the radio service in the army and army corps staffs, and particularly of that for the aircraft.

Retour offensif (*retour offensif*): An attack whose object is to retake a trench, a work, a terrain, or a position which the enemy has seized.

Rifle grenade (*grenade à fusil*, e.g., *obus V. B.*, q.v.): A grenade of cylindrical shape fired by means of a sort of cannon (called in French *tromblon*) which can be fitted to an ordinary rifle. The shell is propelled by the powder in the rifle cartridge; it explodes from

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five to seven seconds later, through the action of a firing powder which is lighted by a trigger set off by the bullet of the rifle.

Sap (*sape*): An excavation which may be subterranean or not dug by men who advance foot by foot; in contrast to a trench or a boyau which is made by men all digging at the same time.

Sapper (*sapeur*): Soldier of the engineers; in a special sense one who digs a sap.

Stationary fighting (*stationnement*): A period of the war of positions during which the troops remain in the same trenches and are unable to advance.

Traverse (*traverse*): A piece of natural soil around which the trench turns, and so placed as to protect adjacent portions of it.

V. B. (Viven-Bessières): Names of the inventors of the V. B. rifle grenade used in the French army. (See under **Rifle grenade**.)

Trench (*tranchée*): A ditch dug to protect troops from the enemy, and to permit them at the same time to remain face to face with him.

Trenches have an offensive object; in that they enable the men to remain in close proximity to the enemy, to cause him losses, and in that they furnish a place from which to launch attacks.

They have a defensive object; in that they make it possible to resist the enemy's attacks, and to confront him with a number of successive lines, difficult to take.

They differ, in interior shape, in tactical purpose, and in the general direction in which they run, from boyaux, which are used for circulation between the trenches and the rear. Boyaux should therefore never be designated by the name "communicating trenches," as is so often done.

On the different kinds of trenches, — first line, doubling, transversal, support, see pp. 83-106. All these trenches may become "firing trenches," in case the enemy attacks and advances into the interior of the position.

The use of other designations (such as "cover trench" for "doubling trench" and "reserve trenches" for "line of redoubts") to describe or define the different kinds of trenches can only lead to dangerous confusions and mistakes.

Trous de loup (*trous de loup*): A kind of accessory defence, consisting of holes dug near each other (diam. about six feet; depth about four feet), with sharpened stakes in the bottom.

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Wave (*vague*): A wave is a formation for combat. It is composed of units (platoons, companies, etc.) placed side by side, and belonging to other larger units disposed in depth. (See pages 191 ff.)

The attacking wave or first wave includes two lines, which are sometimes incorrectly called "waves" in common parlance; these lines are placed about fifteen paces from one another; a third line, composed of trench-cleaners, and often improperly called "the third wave," marches about twenty paces behind the second. The whole of this formation goes forward *en bloc* like a wave; but also like a wave, it tends, if it encounters an obstacle, to resolve itself into a single line, through the piling up of the rearward elements on the foremost.

The following waves (second, third, etc.), which are intended to serve as reinforcing and manœuvring troops, start at various distances behind the first: these distances are secured by the command, either by means of a prearranged time-schedule, by spacings on the ground or by signals.

The frequent and incorrect use of the word *waves* to designate the different lines of one and the same wave has created numerous confusions and ambiguities which it is important to terminate.

Zone (*zône*): Space of terrain of variable size.

- (a) A zone of the front might be as much as fifty miles long and twenty deep. Such a zone may be defined by limits existing in either of the adversaries' lines.
- (b) A zone of attack, of march, or of stationary fighting is the portion of territory, of limited extent, which is assigned to a large or small body of troops, in any phase of the combat (attack, pursuit, march of approach, or stationary fighting).
- (c) Zone fire is an artillery fire directed on a limited space which constitutes the target, without designation of any more special objective inside it.

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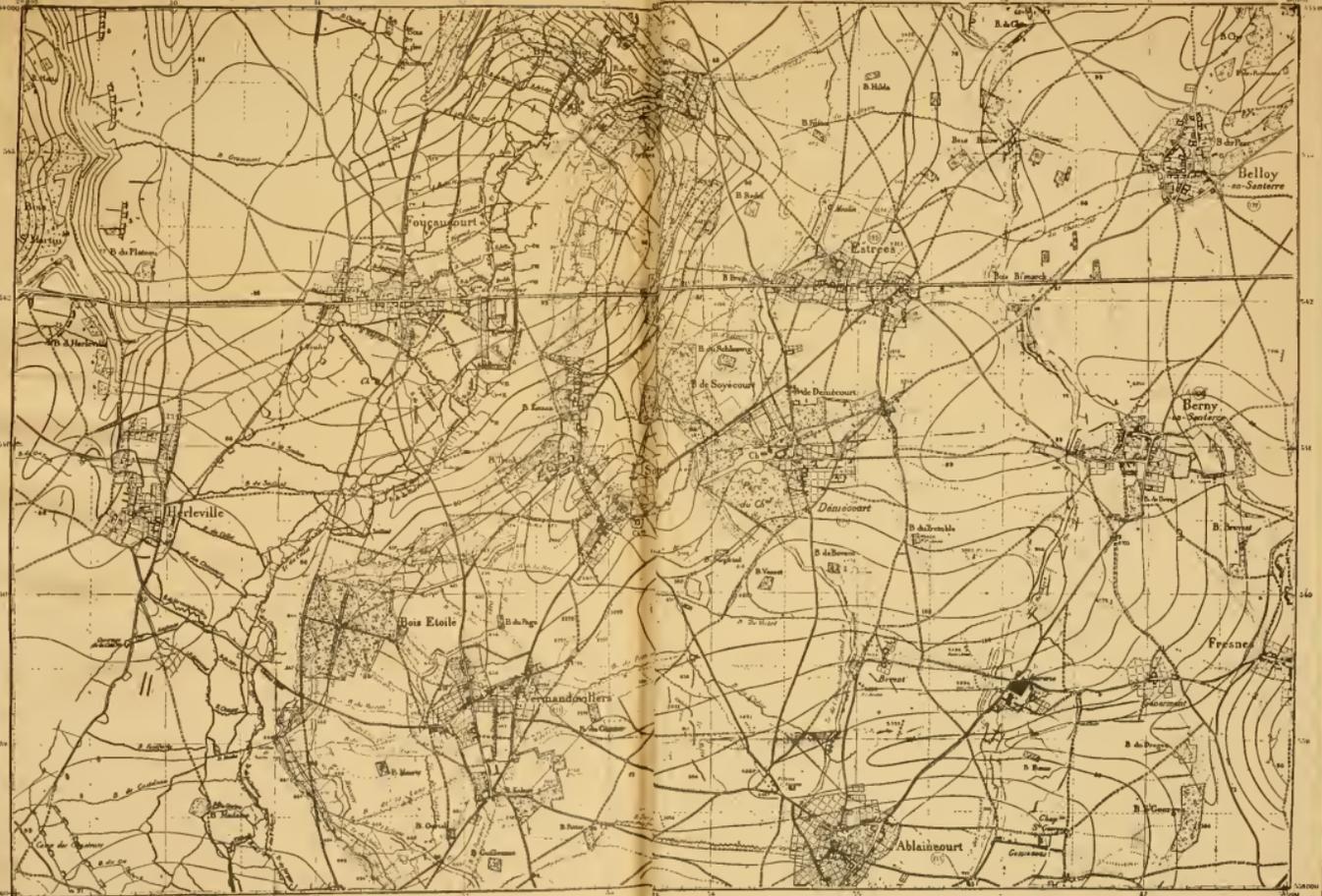
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The warfare of to-day, by

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Échelle: 1:100,000



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